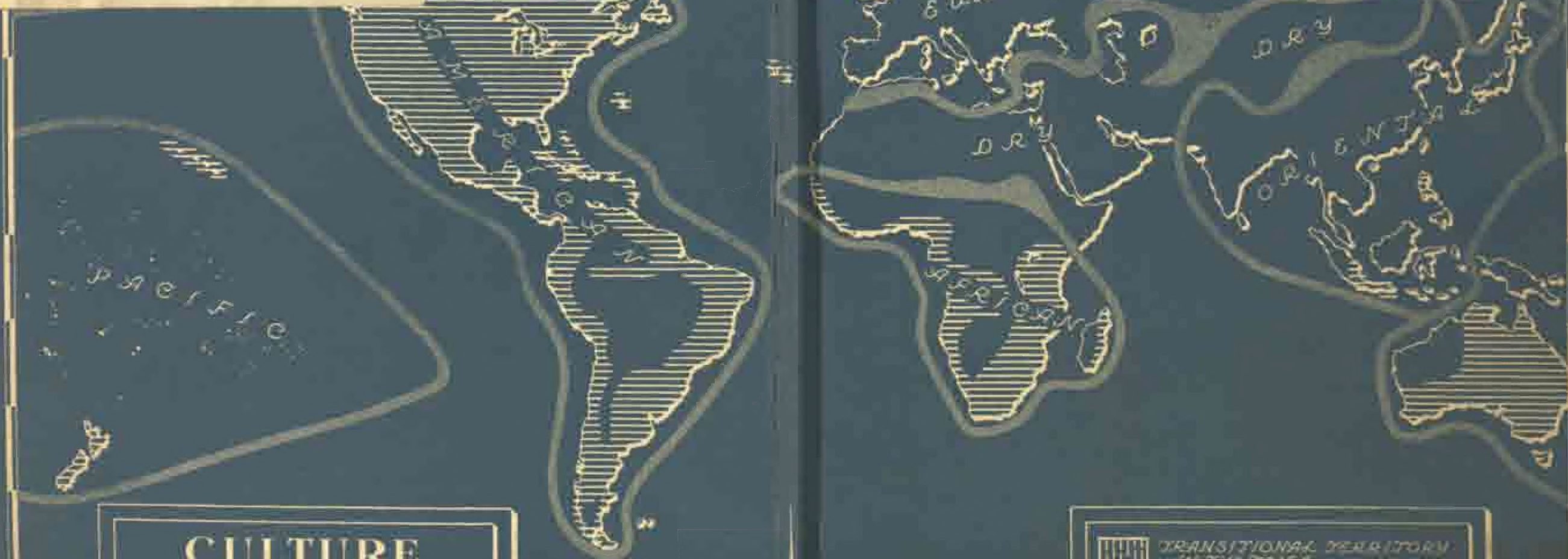


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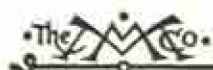
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CULTURE WORLDS



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CULTURE WORLDS

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FRED BOWERMAN KNIFFEN

28864

WITH EMENDATIONS AND CORRECTIONS

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TO CARL ORTWIN SAUER

*who pointed the way, established the
guide posts, and directed many along
the road toward a better understand-
ing of the central theme of geography*

THIS BOOK IS DEDICATED

*Before we present you the matters of fact it
is fit to offer to your view the Stage where-
on they were acted: for as Geographie without
Historie seemeth a carkasse without motion;
so Historie without Geographie, wandereth as
a Vagrant without certaine habitation.*

JOHN SMITH—*The Generall Historie of Virginia,
New England, and the Summer Isles.*

Foreword

STUDENTS were introduced to the subject of geography for many years by the writers of this book according to a plan that has become traditional in universities in the United States—a semester of the “elements” of physical geography was followed by a semester of introductory “regional” geography. The first course covered such matters as space relations, weather, climate, vegetation, soils, relief features, and mineral resources. The second was a hurried survey of the world, patterned on the elementary regional course at the University of California, where both of us served our apprenticeship in teaching geography.

Some ten years ago, at Louisiana State University, we initiated an experiment—the expansion of the regional course to a full year as an introduction to geography at the freshman level, with a shifting of the elements course to the sophomore year. The success of the plan was amazing. From being a subject barely open as an elective to a limited number of students, geography soon became a prescribed course in practically every curriculum in the University. Enrollments in the elements course soon exceeded those of the years when it was offered as the first course in geography.

There are many advantages in the plan of placing a regional course first. A student limited to a single year's contact with geography learns something of the core of the subject and is likely to acquire a rather adequate view of the world's places and peoples. Instructors in other departments soon realize the value of the background students retain from their first year of geography. Students find the subject interesting. Those who return to the department for additional work exhibit refreshing curiosity about subjects covered in the elements and other courses. A student who knows something about the landscapes and peoples of the Sahara is far more likely to want to know why so much of northern Africa is extremely arid than one who first approaches the question from the standpoint of meteorological processes.

Any doubts as to the practicability of presenting a regional, world course to first-year students unfamiliar with the elemental facts of physical geography were soon dispelled by experience. It is found that all essential physical information could be interwoven in regional discussions without the slightest difficulty. There are, in fact, many advantages in such treatment. Concepts such as isotherm, air-mass, tropical rain forest, or chernozem arise not as abstractions but as essential matters of vocabulary in understanding problems at hand.

Of various possible approaches to the problem of presenting a regional geography of the world, that of culture worlds appears most logical, most interesting to students, and most likely to provide a sound background for studies in the social sciences and many other fields. A strictly political approach, so characteristic of the older grade-school geography, is ordinarily dull and encyclopedic. It is difficult to piece together an adequately comprehensive view of the world as a result of progression through such units as comprise the British Commonwealth of Nations. A climatic approach has many advantages, but mainly from the standpoint of physical geography; the cultural side of the subject fares little better than if the organization were along political lines. While there is great similarity among places having climates similar to those of southern Italy, these likenesses arise not only from similarities in soils, topography, vegetation, or other such matters, but also from the fact that all areas of Mediterranean climate are inhabited by

Europeans. Quite dissimilar are landscapes of such climatically grouped pairs as the vicinity of New York City and that of Tokyo, South Carolina and parts of southeastern China, or central Arabia and the Kalahari.

Natural landscapes, with relief, hydrographic, climatic, soil, vegetational, and other forms, undergo only slow and quite inconsequential change in uninhabited regions. Where man enters the scene, landscape change is comparatively rapid, assuming consequence somewhat in ratio to population density. Forms of the natural landscape are modified or destroyed. New forms appear. Animal life and vegetation are commonly disrupted. Culture forms such as trails, roads, canals, or other avenues of communication; decreased visibility in the atmosphere, caused by dust from plowed fields, the escape of carbon particles from chimneys, and the like; tents, houses, towering buildings, and other units of habitation, industrial or commercial activity, or esthetic design; introduction of exotic plants and animals; and many other introduced forms appear in man's cultural landscapes. The logical approach to regional geography is one that proceeds along cultural outlines.

Through the device of recognizing seven culture worlds, the geography of the inhabited parts of the earth is presented in an orderly manner. Each culture world is a reasonably unified subdivision of the earth's surface occupied by peoples who are strikingly alien to inhabitants of other culture worlds. Each has its individual culture traits and its inhabitants have similar ways of changing landscapes. Changes occasioned by the expansion of the European culture world within recent centuries are regarded as stemming from the New World Revolution.

To undertake the writing of a regional geography of the world, whether the plan be that of culture worlds, climatic distribution, or other approach, is a project too comprehensive for any two men to embark upon without feelings of consternation and humility. Possibilities of error and misrepresentation present themselves constantly. Obsolescence in detail is particularly rapid in unsettled times, in a world so severely shaken by the effects of war. Objections to any possible orthography are certain to be voiced. We have tried to use common spellings, favoring as far as possible those in Goode's School Atlas for the reason that we have used it in so many courses and recommend it as an almost necessary supplement to required texts.

In any undertaking of this magnitude it is literally impossible to acknowledge indebtedness to all who have contributed ideas or factual material. Starting with the outline and content of Geography 2 at Berkeley, as presented by Professor Sauer, our lecture notes and syllabus materials have expanded gradually into this book. From the geographical fraternity generally and from various other sources of specific detail have come materials that found their way into our course. In the bibliography we have attempted to list only a few works that may be useful as supplemental readings for serious students and instructors. We have not attempted to cover all sources. With deep appreciation we acknowledge the artistry of Mr. Ted Miller, who prepared maps from our sketches. We owe much to the professional readers, anonymous to us, who saved us from numerous blunders, and will appreciate criticism from all who are kind enough to suggest further improvement.

Richard Joel Russell
Fred Bowerman Kniffen

Baton Rouge, Oct. 1, 1949

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CULTURE WORLDS

1: Culture Worlds

As inhabitants of the European culture world we tend to assume that many commonplace cultural matters are practically universal, whereas in actuality they may seem foreign and unreal to large numbers of the earth's inhabitants.

We live in houses, own land, and recognize certain lines as boundaries between individual properties, states, and nations. Our houses have glass windows, hinged doors, and rooms for such special uses as sleeping, eating, preparation of food, entertaining, and recreation. These habitations are served by definite systems of streets, roads, sidewalks, or other avenues of transportation. Closely spaced groups of houses and other buildings form villages, towns, and cities. At least the more important of these are served by water supply systems, sewers, and such public utilities as gas and electricity. These ideas seem elementary and commonplace to us. Many large parts of the earth, however, are populated by peoples who would find the *culture traits* just enumerated as novel, unworkable, amusing, or beyond the realm of comprehension.

We are self-sufficient to only a very limited degree. Most of us would perish promptly if turned loose without clothing or implements of any kind in territory teeming with fish, abounding in game, and richly endowed with vegetable fibers and food. Even the making and selling of our ordinary garments require the services of many groups of people. To many of the earth's inhabitants, peoples who are highly self-sufficient, these complications would appear ridiculous, but we live in an extremely specialized *culture world*.

People in the European culture world normally make livings by performing highly specialized tasks. The services of many experts are likely to be available to us every day. In any city, town, or large village we expect to find barbers, doctors, lawyers, clergymen, educators, plumbers, and other specialists. We expect to be able to purchase ice, meat, vegetables, utensils of all sorts, and all necessities of life. We assume the presence of "modern" conveniences to be perfectly normal. Many people in other culture worlds would regard such culture traits as strange, anti-religious, or impracticable.

Why do we expect to use such utensils as knife, fork, spoon, plate, glass, or salt shaker at our next meal, while over a quarter of the world's population anticipates the use of chopsticks and bowls? Our parents teach us to use these things. Chinese parents teach their children differently. The knife and fork seem to be inefficient and clumsy implements to them, and they would to us too, had we been adopted in our infancy by some native family in China. We are not born with any prejudices about culture traits, nor with any special adaptability toward the acceptance of those which happen to be characteristic of some particular culture world. The things we grow up with become the normal things and the ways we use them become the natural ways. The things and ways of other peoples are strange in proportion to degree of contrast with ours.

Our forefathers have not used knives and forks for many generations, nor did they know the kinds of clothing we now wear. They were wholly unfamiliar with most of the household conveniences that we accept as necessary or usual. Old culture traits keep giving way to new. Cultures are dynamic, being ever in a state of modification, evolution, and substitution. Any individual culture trait has its place in time as well as its identification with place or people, whether it be the possession of some finite object, such as electric refrigerator, dining room, fork, or dancing slipper; something aesthetic, such as design of pottery, number of notes in an octave of the musical scale, or whether men wear whiskers; or something moral, such as an idea that "white lies" are justified, or that marriages between first cousins are wrong. *Peoples unified in culture traits may be regarded as possessing the same culture*. Every people has its own culture.

The culture of the United States is almost purely of European origin. In the main it developed in northwestern Europe. From the English we have taken our guiding principles of morals and ethics, most of our basic design for living, the fundamental parts of our legal code, our complicated language, and our awkward system of weights and measures. We have modified many English culture traits and will change others in the future.

There are today many cultural contrasts between England and the United States, but as compared with other peoples the kinship is very close. We feel very much at home in England but find many things that seem curious. We observe many examples of what we consider strange conduct, we are confronted with an environment that seems old-fashioned and inefficient, and we probably dislike the way that food is prepared; but we observe that in general the English live very much the way we do, enjoy the things we enjoy, and that they tolerate our cultural differences about as well as we tolerate theirs. Far different and to us far more difficult to understand are the ways of eastern Europeans. Culture traits of the Arabs or of other peoples beyond the confines of the European culture world are so foreign that many seem incomprehensible.

Caesar found in southern Britain a group of barbarians who painted their bodies blue, who were extremely backward in the ways of civilization as measured by Roman standards, and who were even suspected of cannibalism. A tremendous *cultural evolution* occurred in England between the days of the Roman Conquest and the arrival of the first English colonists in America. The English people had changed not only culturally but physically. Only in part were they descended from the Mediterranean and Alpine Britons known to Caesar. The main stock had become Nordic as a result of invasions from the continent. The culture that evolved in Great Britain blended elements brought in by various Germanic tribes such as Angles and Saxons; Scandinavians; and it drew heavily from the French.

Some five thousand years ago all European peoples might be regarded as barbarians. Mesopotamia and parts of Africa stood far higher on what we consider the scale of civilization. In those places flourishing kingdoms existed where people were engaging in specialized tasks. The fruits of luxury were being enjoyed by many. Architecture had made considerable progress. Science was being placed on a solid footing and written records were being kept. Many centuries elapsed before equivalent cultural advancement reached any part of Europe and only as recently as about A.D. 800 did truly post-Roman historical time reach the British Isles.

As we follow the ancestry of our own culture back from northwestern Europe, we find paths that lead to the eastern Mediterranean, Egypt, Mesopotamia, and India. The most remote origins of our cultural evolution really lie in the obscurity of prehistoric events. The parts we know in some

detail have come to us along a route which today crosses parts of three culture worlds.

Man with sufficient intelligence to defend himself with a club, hurl a stone at a specific target, or realize the value of keeping fire alive probably originated in the tropics—we do not know where. Extremely ancient man lived in Java, Africa, and eastern Asia. By some such time as half a million years ago men were inhabiting many parts of the essentially unified mainland between southern Africa, northwestern Europe, and the eastern borders of Asia.

The cultural evolution of man was slow. During most of his early experience he depended on stones, bones, and wood as hard implements. He learned to search for shapes suitable for cutting or scraping. After many thousands of years he discovered that advantageous shapes could be obtained by chipping, which might be accomplished by pressing or striking stones together. Such were the beginnings of an age of crude manufacturing. An important forward step occurred when man found that stones could be made into desired shapes by grinding and polishing.

Less than eight thousand years ago a *cultural revolution* was ushered in by the discovery and utilization of metals by peoples in the Near East. Copper, with its low melting point, was the first metal to be won from ore and used by man. It was later found that a mixture of tin and copper produced bronze, an alloy harder than either and hence more useful. Slowly came the use of iron, steel, and other metals. Very recently the earth's most common metal, aluminum, has come into widespread use, and magnesium has appeared commercially only within the last few years.

Long intervals existed between basic discoveries in making stones and metals available or useful. Still longer intervals were necessary for such discoveries to become matters of widespread knowledge. Cultural change associated with even the most important discoveries were localized for long periods. Most people remained isolated and primitive. The world today has some very backward people according to our standards; but we impress many of them as being extremely ignorant according to their standards. Culture traits spread slowly. The use of iron, for example, dates back to about 1200 B.C. in Asia Minor, 1000 B.C. in Italy, 600 B.C. in Britain, A.D. 200 in Japan, and it started less than a century ago among many inhabitants of Pacific Islands.

Geographers are interested in culture traits and cultures generally because they provide a rational and fundamental basis for dividing the earth's surface into its most significant parts. Peoples who are closest akin culturally tend to modify land-

scapes in similar ways so that they live in places that resemble each other. When emigrating to new territory, people generally prefer to go to places that physically resemble their homelands. New arrivals are prone to alter landscapes in ways to which they are accustomed. New Zealand today looks far more like England than would have been the case if its dominant European population had been French.

Geography is the study of the earth's surface. It is concerned very much with man because he is the most active agent in changing the earth's surface today. Man upsets balances of nature both deliberately and unintentionally. He remodels landscapes to serve his needs, almost at will.

Primitive peoples were for a long time rather ineffective agents of surface change. Once man learned to use fire as a weapon against undesirable vegetation or as an aid in hunting animals a new era of landscape modification began. Grasslands expanded at the expense of forest. Forces of nature capable of removing surface soil layers or cutting ravines began to enjoy accelerated activity. With further cultural advancement man's effect on landscape became more profound. We regard as matter of course such feats as the building of canals; the removal of vast quantities of coal, iron, or other substances from the earth; the transformation of such materials as limestone, shale, and iron into concrete roads that connect widely separated places or into forms useful for the erection of huge buildings. The *natural landscapes* of the earth with their topographic, hydrographic, vegetational, and other forms have been converted nearly everywhere into complex *cultural landscapes* with new forms that vary according to the culture groups who have produced them. Largely unaltered natural landscapes persist only in relatively uninhabited parts of the earth today.

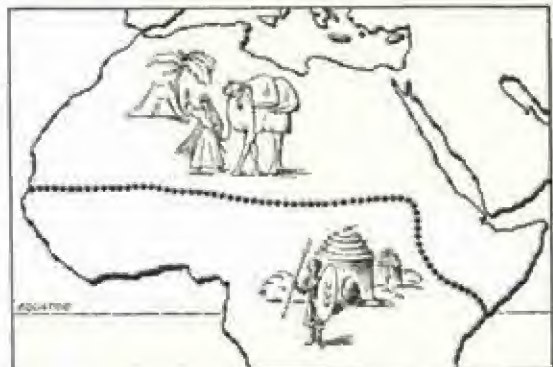
MAJOR CULTURE GROUPS

The geographer is extremely interested in the fact that a culture boundary crosses Africa roughly along a line extending from the mouth of the Senegal River, through Timbuktu, Lake Chad, Khartoum in Anglo-Egyptian Sudan, along the western boundary of Ethiopia, and southeastward toward the mouth of the Juba River. On the north are peoples mainly of Caucasoid racial stock who follow nomadic pursuits, living in tents and moving with flocks, or who live crowded together in oases. On the south are mainly Negroid peoples who live in small huts and houses, who depend largely on primitive agriculture involving the use of crude hoes, or who tend flocks from semipermanent bases. Languages, religious beliefs,

codes of morals, possessions, and practically all other culture traits differ fundamentally on opposing sides of this boundary. Here is a break that separates two major culture groups, Arabian on the north and Negroid on the south. The location of this boundary is not the result of some arbitrary political decision, nor is it a matter of chance. In the main it follows a significant climatic contrast. To the north are vast areas of dry climates, where grassy steppes or barren deserts exist. To the south are vast areas of humid climates, where tropical savannas with rank, tall grass, or rain forest with densely spaced trees, prevail. The Arabian peoples to the north understand how to live in dry regions, while the Negroid peoples to the south understand ways of life in territory where the vegetation is altogether too luxuriant by Arabian standards of usefulness.

The contrast between Arabian and Negroid parts of Africa is so striking that it deserves recognition as a cultural boundary of the *first order*. Relatively few first order divisions between cultures exist. These separate the main groupings of mankind's *culture worlds*. Arabian Africa is part of a culture world that extends far beyond the eastern border of the continent, across much of southwestern and central Asia, to the eastern limits of Mongolia. This entire territory is unified by climatic dryness. It displays striking cultural unity in spite of being occupied by many different kinds of peoples. It is the *Dry World*. Negroid Africa occupies about two-thirds of the African continent to the south of the western end of the Dry World. Though many different peoples live there and cultures vary considerably from place to place, there is enough cultural unity to justify the recognition of an *African World* on the basis of a very considerable similarity among Negroid cultures.

The use of the term *world* for some division of



Boundary between culture worlds



Ancient concepts of the world

the earth or for a group of people is neither new nor particularly novel. Very familiar are such designations as "Old World" and "New World." Christian, political, baseball, woman's, musical, or fashion worlds are recognized in ordinary conversation. The concept world for some small subdivision of the globe was well established in ancient times.

The *oecumene* was the habitable world of the Greeks. Homer regarded the river *Oceanus* as its circular, outer boundary. Hecataeus and other Ionian geographers held that view. Herodotus (484–424 B.C.) advocated a larger *oecumene* with rather indefinite, noncircular boundaries. The "Father of Geography" was familiar with the major surface features of Europe (except in the extreme northwest), western Asia, and northern Africa. Eratosthenes (275–194 B.C.) extended the limits of the habitable world to Somaliland on the south, Ceylon on the east, and the Arctic Circle. Crates of Mallos (circa 150 B.C.) and Mela (A.D. 43) placed a north-south belt of water west of Europe and Libya (Africa) and an east-west belt along the equator, thus dividing the land into the "four quarters of the globe." Only one of these, the *oecumene*, was definitely known. A second quarter, *Antichthonos* (*Alter Orbis*), was supposed to lie in the Southern Hemisphere to the south of *oecumene*. To balance these landmasses it was felt necessary to assume the presence of a second pair of continents on the far side of the globe.

Knowledge of the earth's surface increased rapidly at about the beginning of the Christian Era. Diogenes the Greek and many others traded regularly with India during the first century. Something on the order of embassies and trading posts were established at the courts of several Indian princes by A.D. 100. Marcus Aurelius sent a Roman envoy to China in A.D. 196. By the sixth century, Nestorian Christian monks had smuggled silkworm eggs into Europe ending China's closely guarded secret of silk production.

Early increase in knowledge of the earth's surface did little to extend the limits of the culture world that had its beginnings on lands and islands in the eastern Mediterranean. To peoples of the Far East, Greeks and Romans were emissaries from what might just as well have been another planet. Little interest in adopting the ways of others was manifested either by Oriental or Mediterranean. The spread of early Mediterranean culture hardly advanced beyond the Asiatic borders of the Black Sea. To the west it long fringed the Mediterranean, progressing slowly northward during Roman times to the Danube and the Rhine.

Germanic invasions that accompanied the decline of the Roman Empire brought radical cultural changes to the Mediterranean World. Europe, plunged into a period commonly called the Dark Ages, gradually evolved its Middle Ages' culture patterns. Emergence from the latter witnessed the rise of the general culture of Europe today. The European World, in process of cultural change for many centuries, developed with three main divisions of the *second order*, each of which is a *culture realm*. Within each realm are smaller units, *culture regions*.

EUROPEAN WORLD

European culture is noted for aggressiveness. Europeans, since the dawn of history, have gone to distant lands as tradesmen, soldiers, and colonizers. With them has gone the notion that their own culture traits are "right," all departures being "wrong," barbaric, or of low order. Many Europeans have felt the duty, at times with missionary zeal, of spreading European culture and "enlightenment" among foreign, or "less fortunate" peoples. Rarely does the European question the superiority of his own culture traits. In the eyes of many the success that might attend the efforts of a knife and fork salesman in China could serve as an index of how "progressive" the Chinese are becoming. It is unthinkable, irrational, or humorous to consider the proposition that a Chinese syndicate might flood our magazines with advertisements and our cities with salesmen in an attempt to convert us to the use of chopsticks. What are some of the outstanding traits of this aggressive and self-confident culture?

Field agriculture is a characteristic of the European World. Each field belongs to someone. Workers may live on the individual pieces of land they till, or they may reside in nearby villages. A typical field is large in comparison with those in many other parts of the world. Crop raising involves the use of such implements as metal plows, cultivators, harrows, and harvesters, which may be drawn by animals or powered mechanically. A very large part of the food required by the entire population comes from the fields, but the proportion of persons engaged directly in agriculture is rather small and tends to diminish as time goes on. In lands where more than half the population is rural and agricultural conditions are regarded as "backward." Highly "progressive" regions ordinarily require fewer than one quarter of the people on the land. In England and the United States, under existing conditions, less than 5 per cent of the population need be employed in agriculture.

Industrialization is an outstanding trait of European culture. With it has come a revolutionary change in population grouping, a marked degree of *urbanization*, or growth of large cities. There were a few large cities in the Ancient Mediterranean World—Athens, Carthage, and Rome being outstanding examples. There are some huge cities of non-European origin today. The great city of the European World is something different from either. It is not only a concentration of people, a market on a grand scale, but it is a product of a highly developed technology, a place where raw materials are converted into manufactured products rapidly and in enormous quantities. Industrialization is comparatively new. With it have come many specialized fields of activity, new occupations, and a steady increase in vocational opportunities.

No other culture world approximates the European in technological development and specialization. We may feel that any society should have such people as chemists, astronomers, economists, lawyers, inventors, bankers, auditors, business executives, and the like, but such is far from being the case. A few priests or wise men may combine all these functions and others too. Specialization reaches its greatest degree of development in our own particular segment of the European world. It is not expected that a lawyer should have general knowledge of the entire legal field. Many devote their time only to such phases of law as taxation, insurance, maritime matters, or other highly technical subjects. There was considerable specialization in the days when barbers were called upon to act as surgeons, in comparison with practices in other parts of the earth, but according to standards today we demand the services not only of a highly trained surgeon but of one expert in some small segment of the field, such as treatment of bones. This high degree of specialization has certain counterparts in the caste system of India, but it is mainly a development among peoples of European culture. It has arisen in consequence of industrialization and urbanization. Specialization is least developed in rural areas, where professional people, like general stores, still cater to a wide variety of needs.

The aggressive European World, with such culture traits as field agriculture, industrialization, urbanization, and a high degree of occupational specialization, is characterized by the things and ways that seem most ordinary to us. The point to be emphasized is that our views are by no means universal. Agriculture of any kind is impossible in certain polar lands and unwatered deserts where

people live without hardship. It is difficult in many parts of the tropics and in vast areas of highlands. Let us consider the problem of explaining our culture to the Eskimos of Greenland who were "discovered" by Hans Egede in 1721. Those sturdy people were firmly convinced that they were the only inhabitants of the earth. Our most ordinary possessions would have seemed extraordinary to them. Any attempt to explain field agriculture would have involved concepts almost beyond their comprehension. That lawyers should be needed, let alone those who specialize in patent suits, would have required almost impossible extensions of vocabularies. If Hans Egede, after a lapse of over two centuries, could "discover" us today, his astonishment might well be profound. Being a member of our own culture world in one of its ancestral stages, however, we might expect that his understanding of our things and ways would develop rapidly enough.

ORIENTAL WORLD

Long before Homer assembled tales of Greek exploration, intrigues, disputes, and legends, a distinctive culture had advanced far toward its present condition in parts of northern China. This culture spread southward across the Tsinling Shan into the Red Basin of Szechwan. The spread was resisted by primitive, possibly Caucasoid, inhabitants of eastern Asia. Mongoloid peoples gradually pushed back walls of "barbarism" and spread their culture over much of southeastern Asia. There is an extremely long history here and one that is fairly well known. A culture world developed in China and spread widely, much in the way that another developed around the eastern Mediterranean and spread northward into Europe. There was "progress" where "enlightenment" displaced "darkness," but it was Chinese enlightenment, not our own brand. In many ways this eastern civilization resembled that of Europe, but in many others it differed.

The Indus Valley of western India witnessed another important cultural development in extremely remote times. Spreading to the upper Ganges Valley, this culture became centered in one of the world's most productive regions and therefore felt the attack of many successive waves of invaders, plunderers, and colonizers. The evolving culture of India resembled that of the Chinese somewhat more closely than that of Europeans, in spite of the fact that racial and linguistic ties were closer to the Mediterranean than to the Mongoloid peoples of the northeast.

When modern Europeans came in contact with the Chinese and the Asiatic Indians, they found cultural contrasts so pronounced that a general notion arose that "East is East, and West is West, and never the twain shall meet." The Oriental World is not our world any more than is the world of the North Greenland Eskimo. In extremely ancient times the contrast was somewhat less striking. The most ancient European civilization, the Minoan, arose on the Island of Crete. Other centers of advancement developed in Egypt and in Mesopotamia, similar in many ways to the Minoan, or even to the emerging civilizations of the Far East and India. The Greeks inherited and blended much of the culture of Crete, Egypt, Mesopotamia, and even India. It was undoubtedly easier for an ancient Greek to feel more or less at home in India or China than it was for Europeans during the Commercial Revolution, after European cultures had evolved far along lines divergent from those of the Oriental World.

DRY WORLD

Between the European and Oriental worlds is the largest and broadest belt of arid climates on earth. This belt reaches the Atlantic along the coast of northern Africa and extends to the Great Khingan on the border of Manchuria not far from the Pacific. Within it are many individual deserts, some of almost continental dimensions. The *deserts* are territories of extreme aridity, with broad surfaces too dry to support enough grass to permit a grazing economy. Marginal to the deserts are less arid *steppes*, too dry for forest growth but with enough precipitation to support grasses that grow to low or medium heights. The grass is bunchy and scattering along the arid borders of the steppe, but it is taller and more luxuriant along the borders of *humid climates* where precipitation is ample to support forest growth. The Dry World not only has served as a barrier between peoples in culture worlds of the humid climates on either side but has developed a significant culture of its own.

Dry World peoples are typically nomadic, or else they dwell in more or less congested oases. In order to survive under conditions that most of the earth's inhabitants would consider intolerable, it was essential that they develop ways of life unknown elsewhere. Many Dry World culture traits are of necessity quite different from those of Europeans, Orientals, or Negroid Africans, most of whom evolved cultures in well-watered lands. Though numerous contrasts separate cultures of Arabs from those of Mongolians, the nomads of western Africa and the herders of

Gobi have far more in common than either has with peoples beyond the limits of the Dry World.

There are several other large arid tracts on earth where man has faced essentially the same problems of survival that exist in the Dry World but where his solutions have taken entirely different courses.

AFRICAN WORLD

To the south of Dry World Africa is the home of most Negroid peoples. Isolated from European cultures by broad, inhospitable deserts and inhabiting territory only partially suited to adaptation of Dry World culture traits, African World peoples have solved problems of living and have developed cultures along lines strikingly unlike those of peoples to the north. To Europeans, most of Africa long remained the "dark" and mysterious continent. Contacts between African and Dry World peoples were more frequent. The island of Madagascar, though predominantly Negroid, was invaded on several occasions by peoples from the Oriental World, who introduced such culture traits as the use of a Malayan language, outrigger canoe, water buffalo, rice, and terrace agriculture, but who failed to implant a completely Oriental World culture pattern.

POLAR WORLD

The *taiga*, a broad, monotonous forest, separates territory inhabited by Europeans and Orientals from a belt of *tundra*, or treeless territory along the shores of the Arctic Ocean. Mongoloid tribes found their way into the tundra at an early date and there learned to live mainly at the expense of animals. Severe climate precluded agricultural pursuits. A Polar World culture originated and spread both westward along the Eurasian landmass as far as northern Norway, and eastward along the mainland and islands of North America into Greenland. Isolation and extreme contrasts in culture traits set off the inhabitants of these Arctic territories as a culture world quite unlike any other.

No similar development occurred in the Southern Hemisphere. The Antarctic continent was too remote and too hostile environmentally to be habitable. The scattering islands of the southern oceans for the most part remain uninhabited to the present day.

AMERICAN WORLD

When Columbus took part in a period of exploration commonly known as the Voyages of

Discovery, he found peoples who were mistakenly identified as Indians because they were thought to be inhabiting some part of southern Asia. Racially these peoples were predominantly Mongoloid, being rather closely related to the inhabitants of northeastern Asia from whence their ancestors had come during several different invasions of the American landmass. Their departures had occurred at such remote dates that little or no trace of Asiatic cultural heritage remained among them. In the Americas they had found many different kinds of natural landscape and they had evolved many distinct cultures. The highly developed civilizations of Mexican and Andean plateaus compared favorably with any contemporaneous European culture and in some respects were superior. The Maya, for example, had a far more accurate calendar than existed in Europe, and various Indian groups had domesticated plants on a scale that has never been duplicated elsewhere, even in our own days of scientific advancement. If we subtract the contributions of American Indians from our list of foods, diet becomes a rather drab affair.

Though several sharply different culture realms developed in the Americas, the land of the Indians possessed enough similarity to be recognized as the American World.

PACIFIC WORLD

The continent of Australia and the many islands lying to its immediate north and extending out into the Pacific Ocean may be regarded as a single culture world, though it contains several sharply differentiated realms.

Australia long remained remote from European and Oriental standpoints. Together with adjacent islands it was inhabited by some of the world's most primitive peoples, whose cultural development was unique in many ways. Their material wealth was small and they possessed few cultural heritages of Oriental World origin. They developed among themselves some of the most original social organizations known to the modern world.

The oceanic portion of the Pacific World is readily divisible into three major realms. Polynesians, the latest arrivals, settled many islands extending northward from New Zealand in a roughly triangular area that reached eastward to Easter Island and northward to the Hawaiian group. Somewhat earlier Melanesians occupied islands from New Guinea to the Solomons, Fijis, New Hebrides, and New Caledonia. To the north is the Micronesian realm along a belt that includes

the Caroline, Marshall, and Gilbert Island groups. Other peoples, greatly mixed racially and culturally, live on islands along the westernmost fringes of the ocean.

NEW WORLD REVOLUTION

From about the beginning of the sixteenth century, Europeans have embarked on waves of domination, conquest, and colonization on a scale such as the world had never experienced in any earlier period of man's history. Of course there had been many important early migrations and conquests; armies had moved thousands of miles on errands of subjugation and plunder, uninhabited territories had been appropriated by peoples in search of new homes, but all such events pale into insignificance when compared with the happenings that followed the Voyages of Discovery. Possessing superior ships, more effective arms, and a feeling of righteousness in their will to spread religion and culture, as well as to establish new avenues of trade, Europeans initiated with extraordinary vigor an attempt to dominate the entire earth soon after Diaz, Cabral, Columbus, da Gama, and other exploratory adventurers opened their eyes to the vastness and variety of existing lands. This entire movement is the *New World Revolution*. It is still in progress.

New World includes those parts of the earth that have experienced the introduction of European World cultures at the expense of cultures already present. The typical pattern of New World Revolution is illustrated by the Americas, where Europeans have succeeded in displacing or exterminating original American World cultures over vast areas. The pattern is also exhibited in parts of South Africa, Australia, and on many islands in the Pacific World.

Europeans generally appraised foreign lands according to their values by European standards and then used whatever means they possessed to dominate or occupy the most desirable. In many cases native peoples or cultures were exterminated, a process that was characteristic of Tasmania, Australia, and most of the United States. In other cases there was considerable assimilation and mixing of both peoples and cultures, such as is typical over much of Middle and South America and many parts of Polynesia. "Island" remnants of old cultures commonly remained after the contest between European and native had established new frontiers. There are many Indian groups in the Americas that are almost untouched by European culture today.

The older, well-established cultures of the Oriental and Dry worlds have proved extremely resistant to New World influences. Much Dry World territory is hostile from a physical standpoint and escapes European inroads for the same reason that much of the Polar World, or other frigid regions, remain untouched today. The European ordinarily finds that he is unable to compete with the native occupants of hostile territories such as desert or tundra. His culture traits would prove poor substitutes for those he might seek to displace. The culture traits of the Oriental World are held by such vast hordes of people that Europeans have made little headway in displacing them. The Oriental may feel about the same contempt, pity, and superiority over the European as the latter toward a primitive savage. Many *island outposts* of European culture have been established in the Oriental World, some being important and large, such as Shanghai or Hong Kong, but they have not developed any significant *hinterlands* of culturally revolutionized back country.

In South Africa the domination of Europeans has developed according to typical New World patterns and has reached nearly to completeness over extensive areas. "Progress" has been spotty in most other parts of the African World.

Russians were pioneer participants in the New World movement. A *Siberian Wedge* of European culture was pushed across Asia to the Pacific and temporary outposts were established at an early date along the western coast of North America. Today no other people surpass their activity in thrusting cultures and influence into foreign culture worlds. The Dry World boundary has been pushed back notable distances in central Asia and the hostile taiga is being crossed. Deep inroads are affecting the Soviet segment of the Polar World.

Less than half of the New World lies in the Western Hemisphere. In general the newer parts of the New World are beyond its limits. Mexico, Peru, Brazil, and the United States were deeply affected by the New World Revolution long before it had taken significant hold in South Africa, Australia, New Zealand, or most Pacific islands.

THESIS

Individual societies of people possess characteristic culture traits that enable social scientists to group peoples according to their cultures. The broadest of these groupings are culture worlds. Seven of these are so distinctive that they form an excellent basis for introducing students to the field of regional geography. These broadest subdivisions of the earth are the European, Dry,

African, Oriental, Polar, Pacific and American worlds. Their geographical distribution is shown on the end papers of this book. Each has subordinate realms and regions. Culture worlds have differentiated gradually, each as the result of long and complicated series of events and experiences. Contrasts among them have arisen mainly because of isolation. Within the last few centuries the European World has undergone amazing expansion, a movement recognized as the New World Revolution. European peoples and cultures have advanced into other culture worlds with marked success in many instances, indifferently in others, and with failure in some.

The primary interest of the geographer is in the earth as it exists today. He seeks to understand and explain its surface. In most places he finds man at work, consciously or unconsciously, effecting changes in the face of the earth. The type of change varies in accordance with the culture group concerned. Each culture world, realm, or region tends to assume its own landscape peculiarities. The general effect of the New World Revolution is that of modifying the earth into forms characteristic of European cultures.

Prior to the advent of civilized man on the scene, natural landscapes underwent only very slow modification. The cultural landscapes of primitive man introduced certain upsets in vegetation and minor evidences of material culture. Where population densities remain low, departures of cultural from natural landscapes are small. A pile of stones, an obscure trail, a few scattered tents, a few introduced animals, or evidences of overgrazing may serve as illustrations. What meets the eye today—the towering pagoda, extensive deforestation, herds of cattle, fields of wheat, the pall of haze above an industrial city, the river ferry, or advertising blimp—are the forms of the cultural landscape, a complex expression of man's cultures, superposed upon or replacing the forms of the natural landscape. Each culture world has not only its characteristic differences in culture traits, but also its own typical cultural landscapes. The most logical introduction to regional geography is through the medium of these culture worlds.

POLAR WORLD

2: Natural Landscapes

Of the seven culture worlds into which the earth's surface may be divided, the Polar World is physically and culturally the least complex. Though it occupies a relatively unimportant place in the affairs of man, it serves admirably as an introduction to the concepts and kinds of materials to be considered in a geographical treatment of man's occupation of the earth.

The Polar World is comparatively simple economically because the activities of its inhabitants are sharply restricted. Its natural equipment limits the bases of man's existence mainly to primitive fishing and hunting, and to a small amount of reindeer herding. Following these ways of life, population is of necessity sparsely distributed.

Polar landscapes appear strange and wild to the traveler from the European World. Nature, rather than man, dominates the scene. Almost completely absent are many features that the European assumes to be part and parcel of inhabited regions: farms and urban centers, roads and railroads, factories, resorts, fortifications, or politico-administrative centers. Even the forewarned traveler finds difficulty in distinguishing the forms created by the Polar World native, so subordinate and well adapted is he to the land in which he lives.

The simplicity of the Polar World cultural landscapes results from the severity of the environment: from cold, ice accumulation, absence of forest and agricultural land. The basic needs of man are satisfied in simple and direct ways. The consumer is in close contact with the things he needs. There is sharp limitation as to the choice of ways in which man satisfies his fundamental wants.

Restricted and direct as Polar World material cultures seem, they are not entirely uniform along the Arctic fringe extending from northern Norway across Eurasia and North America to eastern Greenland. Fishing methods change in each area. Treatment of the caribou and its uses to man differ notably from place to place. Kinds of weapons vary, as do the materials from which they are made. On the basis of diversity in culture traits the Polar World falls into two main culture

realms. Each of these realms includes many significant culture regions.

The limits of the Polar World are culture boundaries. The extent of the Polar World is determined by the geographical distribution of a general way of life. In North America the Eskimo lives on one side of the boundary, the Indian on the other. Across Eurasia the cultural demarcation lies between such peoples as Lapps and Europeans, or between tundra dwellers of Siberian coasts and the forest tribes to their south. In Asia the boundary is less sharp than across North America. The forests of the taiga are sparsely inhabited and to some extent are invaded by Polar World peoples. In recent years there has been pronounced migration of Europeans into the taiga. On the map of culture worlds (end papers), a wide zone of transition is indicated between the Polar World and the Siberian Wedge of the European World.

There is general parallelism between culture boundaries and natural limits. The northern edge of the forest approximates the southern extent of both Arctic regions and Polar World peoples.



Realms of the Polar World

Forests grow about as far northward as the July isotherm of 50° F. This isotherm is a line connecting adjacent places where the average temperature during July amounts to 50°. On the northern side and on land that stands topographically higher, the average temperature is cooler, while to the south and on lower land it is warmer. July is the warmest month of the year in Arctic regions.

The July isotherm of 50° F. closely approximates an important botanical and ecological boundary between lands widely covered by trees and those where insufficient soil warmth exists to permit forest cover. To the north and at higher levels lies treeless tundra, whereas on the warmer side of the isotherm is the taiga forest. The Polar World is chiefly a cultural development of the tundra, but it encroaches beyond the tundra at some places, and not all tundra falls within its limits.

Iceland is mainly a region of tundra vegetation and climate, all months of the year being cooler than 50° F., but in no sense is it part of the Polar World. The first settlers were Europeans and no culture other than European has ever been established there. Iceland was part of the European World originally and so it has remained for over a thousand years. The Aleutian Islands, on the other hand, where climatic conditions are somewhat less severe, are inhabited by Eskimolike Aleuts whose culture is distinctly that of the Polar World. Uninhabited Arctic lands and islands lie beyond the limits of any culture world.

European culture, with its basis in the agriculture of temperate, humid climates has made little progress in Polar or subpolar regions. Outposts of the European World are fairly numerous and have been for several centuries. Furs, whaling, minerals, and scientific exploration have offered rewards sufficient to attract Europeans into "frozen" lands, but mainly to sharply localized destinations where they have retained European ways of life. Few Europeans have given up their own culture to adopt that of Polar peoples permanently, and few Polar World inhabitants have become permanently incorporated into the European, or other, culture worlds.

LANDFORMS

The Polar World is located around the borders of the Arctic Ocean. The belt is quite circular and lies between the Arctic Circle and the latitude of 75° N. nearly everywhere. One of its major irregularities pushes it beyond 78° in western Green-

land, and it dips southward, nearly to 50°, in the Aleutian Islands.

Arctic shore lines are extremely irregular in pattern. Many peninsulas jut far poleward, such as Boothia in Canada and Taimyr in Siberia. The American sector is characterized by many islands, both large and small. To the east is Greenland, the world's largest island. The sea is relatively shallow between Greenland and the European mainland. Iceland, Jan Mayen, Svalbard (Spitsbergen), and other islands rise above a submerged continental platform. To the east are such detached continental fragments as Novaya Zemlya, Northern Land, the New Siberian Islands, and Wrangel Island.

Various named seas lie between island groups and major promontories of the mainland coasts. Practically every coast fronts a sea that bears its own name, rather than the general designation, Arctic Ocean. Arctic waters deeply indent the coast of Europe as the White Sea, and that of western Asia as the Gulf of Ob. The greatest indentation of all occurs in the American sector, where Hudson Bay, a shallow continental sea, extends southward to approximately 51° N., into territory well south of the Polar World.

Both of the major Northern Hemisphere oceans open into the Arctic. The mighty Pacific is served by Bering Strait, a channel only 36 miles wide that has little importance at present, either naturally or commercially. The Asiatic and American peninsulas in the vicinity of the Arctic Circle on either side of the strait are parts of an important *land bridge* over which many animals and plants migrated freely between the two major continental masses. This bridge now has "a few planks removed," but is not difficult to cross. Of greater consequence as a barrier is the water connection between Atlantic and Arctic oceans with its many individual passageways, broadest of which lie between Labrador and Greenland, Greenland and Iceland, and between Iceland and the British Isles or the coast of Scandinavia. Though continuous land has spanned these gaps at various times in the geologic past, and plants and animals have been able to migrate from one continent to the other, this land bridge has not functioned recently. No primitive man has ever crossed it. Warm waters from the Atlantic have long flowed through the eastern channels to the Arctic, and cold waters from the latter have long drifted southward along the coast of Labrador bringing icebergs from Greenland that render North Atlantic travel seasonally hazardous.

Several large rivers flow northward to the Arctic from continental interiors. Among the larger are the Mackenzie of North America, and the Ob,

Enisei, and Lena of Asia. The Yukon reaches the western coast of Alaska well within Polar World limits. These and other rivers serve the important function of bringing from forested regions driftwood that eventually finds its way to timberless Polar World shores. They also serve as routes of invasion for Europeans and European culture into the Polar World.

Most of the land of the Polar World is flat, consisting of coastal lowlands or low plateaus. True mountains, with rocks that have been elevated and folded, exist only marginally or in a few scattering areas, as along the coasts of Greenland, eastern Labrador, or eastern Baffin Land. Some of the flatness is due to the recency of origin of polar lands, for polar lands include extensive alluvial deltas and plains of recent sedimentary deposits. Flatness of old-rock territory indicates the extremely rapid rate at which processes of weathering and the transportation of weathered debris attack and reduce topographic irregularities of all kinds. Little land is protected by a cover of true soil. Rocks are exposed nakedly to the forces of nature. Changes in temperature, the prying action of ice being formed in crevices, chemical attack by waters that carry organic acids, and similar processes break rocks to pieces. During the warm season, when surfaces are thawed, saturation of fragmental debris promotes downslope movements at rates rarely experienced in other climates. The presence of permanently frozen ground at slight depth below the surface prevents downward seepage of water and thus concentrates saturation in the layers at the immediate surface. With such effective and widespread downslope transportation of rock debris at work, there is little wonder why so few hills manage to rise above the territory surrounding them.

Arctic and subarctic regions exhibit many interesting landforms that are almost unique. Slopes are commonly *striped*, as if gigantic rakes had been drawn directly down them. These alternating banding effects result from the varying speeds with which rock fragments travel downslope. In bands where movement is fastest all slabs of rock stand edgewise. These are annoying to the traveler on foot, who soon learns to avoid them wherever he has the option. In bands where slower movement is taking place rocks have random orientation, some lying flat, others inclined at various angles. These are much easier to walk upon. Some of the fastest-moving bands are called *rock streams*. They lead downslope to *talus* accumulations which resemble the piles of rock rubble that accumulate beneath steep slopes in milder climates. *Polygon ground* (polygonboden) occurs

in flatter regions if the surface is underlain by a mixture of coarse stones and fine debris. Somewhat circular or roughly hexagonal rings of stones tend to accumulate on the surface. These peculiar patterns are a result of *frost action*, the upward shoving of rocks which occurs when water freezes and expands in becoming ice. Large stones are pushed upward through sand or other finer materials. On gentle slopes the polygons become elongate *stone nets*, which stretch out downslope. On steeper slopes these stone nets become the stripes of fast-moving debris. The stripes on the hills of the Arctic landscape are in reality a member of a series that includes the polygon ground of flatter areas.

Though hill and slope landforms are distinctive and interesting, they are not widespread because so much of the Polar World is essentially flat. Valleys are comparatively rare. Stream erosion is not impressive in territory that is undergoing such rapid flattening of surfaces for reasons such as free movement of saturated rock debris. The typical stream of the tundra is sluggish in flow, active only during the season of thaw, and it winds aimlessly through many lakes and ponds. Boggy flats, many with knee-deep ooze surfaces, lie below extremely gentle slopes.

While the resident of the Polar World is directly concerned with such landform details as have just been described, particularly with regard to contrasts significant from the standpoint of journeys on foot, he is acutely aware of a broader distinction between the three most important kinds of surfaces in Arctic regions: (1) ice-free land, which is likely to be rather flat and tundra covered but in some places steeper and rocky; (2) ice-covered land, or inland ice; and (3) the sea with its varying surface, which at times is water and at other times more or less solid ice.

CLIMATE

Climate is the most important natural factor giving distinctive character to Arctic lands. It conditions the development of landforms, drainage forms, vegetational types, animal life, and looms large in the lives of native peoples.

The common picture of the Arctic as a place of extremely low temperatures, howling blizzards, and vast accumulations of snow is true in a few places; but the cold pole of the Northern Hemisphere lies somewhere near Oimekon in northeastern Siberia, well south of the Arctic Circle, where summer is quite warm. All regions of maximum snowfall lie in much lower latitudes, as in

the mountains of Washington and California. Blizzards are fully as common in European World lands as in the Polar World.

The Arctic does have the lowest mean annual temperatures in the Northern Hemisphere. The average temperature, day after day and year after year, is lower than elsewhere. Low mean annual temperature, however, does not imply extremely cold winters. Cool summers contribute just as effectively as cold winters in holding down temperature averages. The yearly temperature in most parts of the Polar World is far more uniform from season to season than in temperate regions many miles to the south. The summers are far cooler, and winters are generally warmer than those of such places as southern Canada or central Siberia. Mean annual temperatures are higher in these "temperate" latitudes only because the effects of severely cold winters are offset by high degrees of summer heat.

In the warmer parts of the Polar World, the taiga border of the tundra, the average temperature of July is on the order of 50° F., which means that summers are cool throughout the Arctic. This coolness favors preservation of the winter's ice and snow accumulations. It also inhibits plant growth. Few plants germinate or grow at temperatures

lower than 40°. A summer with only a few weeks warmer than 40° and no month ten degrees higher is so cold that forests will not grow and most agricultural practices normal to milder lands can not be carried out.

Arctic summers are times of nearly continuous sunshine. The amount of *insolation*, or radiant energy received by the earth from the sun, is relatively great, but it has little effect on raising air temperature. The sun never stands high above the horizon. Its rays penetrate great thicknesses of air before reaching the earth's surface and experience many heat losses, such as arise from reflection by clouds or absorption by atmospheric moisture. Sunlight reaching the ground comes in at low angles and is therefore spread across wide surfaces, so that any individual unit area receives far less light and heat than would be the case were the sun overhead. Most important of all is the fact that a tremendous amount of solar energy is expended in melting ice and evaporating water. For these reasons there is little insolation actually available for raising air temperature and thereby creating summer warmth.

Arctic winters are dark. The *winter night* at the North Pole lasts approximately six months. It is shorter as latitudes are lower. Along the Arctic Circle the sun fails to rise above the horizon on but one day each year. Winter is a season of heat



Margin of ice-covered land in Baffin Island. (American Geographical Society)

loss by radiation into air and thence into space. Now and then some Arctic borderland is warmed because a mass of air that has been heated elsewhere moves over it, but such effects are temporary. As a general rule the temperature drops to low levels soon after summer ends, and stays there.

While cool summers and cold winters are the rule of the Arctic, considerable differences exist in accordance with the three major types of surface.

Ice-covered land, such as that of the interior of Greenland, has both cold winters and cold summers. The July isotherm of 32° F. parallels the edge of the icecap. This means that all places in the interior have average temperatures below freezing during even the warmest month of the year. Such places have climates of "perpetual frost," or are lands without summer. The normal movement of water is not that of ordinary flow, such as exists in rivers, but is the slow creep of solid ice.

Temperature of air above sea differs according to whether the surface is ice or water. The remote, permanently ice-covered, central part of the Arctic Ocean resembles ice-covered land in experiencing cold summers. Toward the margins of the sea ice, where leads of open water here and there break the continuity of the ice, summers are somewhat warmer, but winters are cold.

Point Barrow, on the northern coast of Alaska, faces a sea of ice in winter and one of water in summer. February, the coldest month, has an average temperature of -20° F., while July, the warmest, averages 38.5°. Svalbard, though much farther north, but in open water for a longer season, experiences a range from -2° to 42°. Angmagssalik, on the east coast of Greenland, close to the Arctic Circle, has a range of from 13° in February to 44° in July.

Land temperatures everywhere have greater extremes than those above ice or water. Contrasts between winter and summer increase with distance from the sea, or from land ice. Though the average temperature for July does not rise above 50° in the tundra, individual days may be oppressively hot. Some days or weeks during winter exhibit corresponding extremes in severity of cold.

Verkhoyansk, in the taiga forest of northeastern Siberia, more than 250 miles inland, has a long weather record and for many years was believed to be the cold pole of the Northern Hemisphere in winter. The average July temperature is just barely lower than 60°, while in January, the coldest month, the average is -58.9°. The seasonal range between these monthly averages is 119° F. The highest and lowest temperatures

ever recorded for Verkhoyansk are approximately thirty degrees higher and lower than the averages for their respective months, giving a record range in the neighborhood of 180°! Short-record stations to the south suggest even more extreme conditions.

Polar World peoples avoid the cold summers of inland ice and rarely venture far into regions of sea ice. Their ordinary habitat is the tundra, where summers are cool and winters are cold.

The effect of temperature on one's senses, or the *sensible temperature*, is only roughly parallel to thermometer readings. Human comfort is influenced strongly by humidity and wind. Very low temperatures are bearable during calm weather. Comfort is further conditioned by such factors as prevalence of light or darkness, the presence or absence of insect pests, and the possession or lack of proper clothing.

Dry, still air at temperatures down to about -60° F. does not interrupt normal winter activities of polar peoples, nor those in other lands subject to such extremes. Temperatures thirty or more degrees higher in moist air, especially if accompanied by blizzard winds, may drive every living thing to shelter.

Winter is a time of festivity and visiting among Polar World peoples. To the European it is a spectacular season, during which he may experience such novelties as the rattling of his breath, the extreme distances that sound carries, and various interesting phenomena overhead, such as sun dogs, the aurora borealis, or magnificent skies lighted by myriads of friendly stars. Most Europeans, however, are depressed mentally by long periods of darkness during a prolonged winter night.

The passing of winter is marked by a rise in thermometer readings. The change of season is likely to be accompanied by disagreeable storm winds, icy blasts far more biting than the true cold of the Arctic winter. Quiet summer air along coasts is inclined to remain foggy for long periods, and the fog is commonly dense. The warm season finds unbelievable swarms of insects rising from the tundra ready to make life miserable alike for man and beast. Even the European long resident in the Arctic gradually learns to prefer the night of winter to the day of summer.

Precipitation is meager in most Arctic regions, the total rainfall and snowfall amounting to a depth of water less than ten inches. In lower latitudes such paucity would mean desert, or at least extremely arid steppe climates and landscapes. Arctic aridity is tempered because water evaporates

very slowly when cold. Even where the annual precipitation is well below ten inches, ground may remain wet and boggy during most of the warm season.

At low temperature, air has very little capacity to hold water vapor. Meager precipitation is one of the results of air dryness. People are affected too. Winter travelers commonly experience desertlike thirst in the Arctic. Tundra plants display many adaptations to scant water supply that cause them to resemble plants in deserts. On wet and boggy ground they exhibit types found in the marshes of more temperate regions.

Snow that falls at low temperature descends as individual needles, rather than in the form of large flakes. These needles are dry and hard, so that they have little tendency to cling to objects they hit, or to each other. Wind lifts dry snow easily and whisks it about to settle in sheltered locations, such as ravines or the lees of prominent obstructions. Most of the tundra is snowless except during actual precipitation. Local accumulations may persist through warm seasons, forming white patches that contrast sharply with the surrounding ground surface, which is ordinarily black or dark gray. Many Arctic landscapes have a peculiar black and white appearance that appears zebriine where snow accumulations lie in closely spaced ravines.

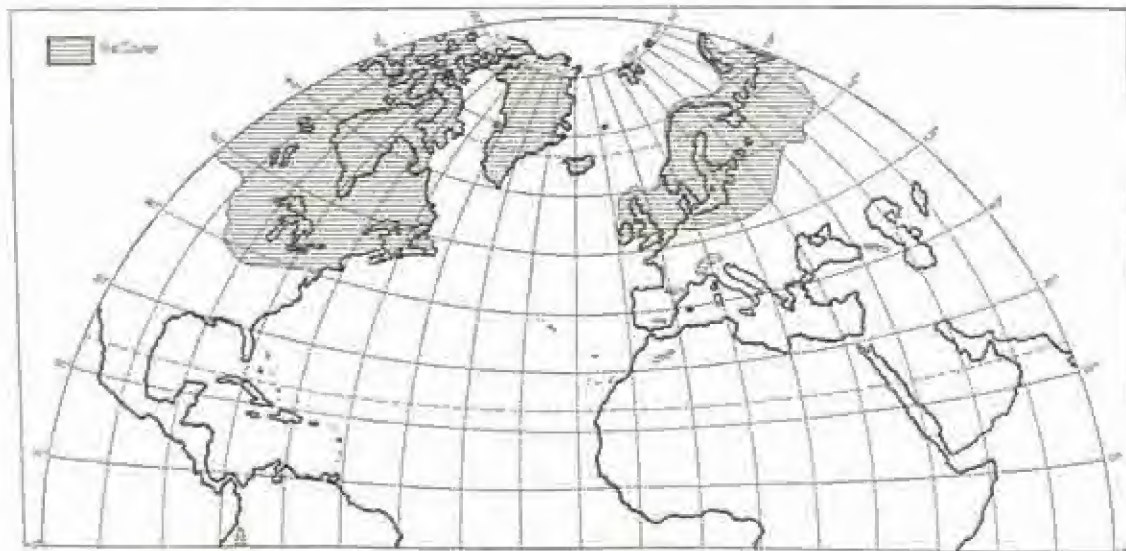
The combination, dryness and cold, has preservative effects on organic substances. Driftwood resists rotting on Arctic shores. Meat keeps fresh indefinitely. The dry frozen ground of the

tundra at many places has kept intact the bodies of mammals long extinct. The most spectacular of these are woolly elephants, so numerous that "fossil ivory" is an important trade commodity of the Polar World.

Masses of cold, dry, and heavy air pile up to considerable depth over the Arctic, with such characteristics accentuated each winter. These air-masses act as barriers to the introduction of air from southerly regions and have much to do with low precipitation rates. The northernmost Arctic islands and parts of northern Greenland are practically ice free because they are overlain by dry air practically all of the time. Even during the Ice Age, when climatic conditions similar to those of central Greenland extended as far south as the Ohio River in North America and as far south as central Germany, these northernmost lands escaped ice cover.

Flying conditions are generally good across the Arctic air-mass. Icing is not likely to be serious in extremely cold, dry air. The main difficulties encountered by users of polar air routes occur around Arctic margins, where there is more moisture.

Invasions of warmer and moist air into the Arctic occur mainly toward the northern ends of the two great oceans, where weather conditions are frequently upset, precipitation is heavy, and bad icing conditions plague aircraft. The vicinity of the Aleutian Islands is one of atmospheric unrest for many days or weeks at a time. Similar conditions occur across the North Atlantic. The only Arctic territory with sufficiently heavy snowfall to accumulate large covers of land ice lies be-



Ice Age conditions

tween Baffin Land and Novaya Zemlya. Ice Age climatic patterns were similar, for this same region served as the main center around which the great continental icecaps spread.

ICE ACCUMULATIONS

Of the three main types of surface in the Polar World, only the tundra remains free at all times of a surficial mantle of ice.

The extensive areas of land ice lying near the Atlantic-Arctic openings are expressions both of heavy precipitation and cool summers. Each land-ice area tends to preserve itself, or even to help itself grow in size, because it depresses summer temperatures and thus combats the great enemy of ice, heat. It is believed that an icecap would not extend into southern Greenland today were it not for the cooling effect of the great ice mass to its north. A large icecap affects temperatures not only in the immediate vicinity but also hundreds of miles away, because its low temperatures are carried by wind.

Greenland alone, among Northern Hemisphere land-ice accumulations, has a true icecap—a turtle-backed mass so widespread and thick that it obscures most of the original bedrock topography beneath.

The central parts of Greenland are comparatively flat at elevations of from 8,000 to about 10,000 feet above sea level. The only local relief features are minor details, such as low, parallel ridges of hard, crystalline snow. No body of solid rock reaches the surface anywhere. That there is upward convexity in the ice mass is apparent around edges of the ice, where slopes steepen, gradually at first and then more sharply toward the ice margins. In this marginal zone occur some sharp differences in level, steps that reflect, through a relatively thin ice mantle, abrupt contrasts in the underlying topography. Cracks and crevasses occur where slopes steepen in outward-moving ice streams. In a zone about fifty miles wide, along the ice margins are *nunataks*, or mountain peaks of solid rock that rise through the ice. A band of rocky territory separates the icecap from the sea along most coasts. Well-defined glaciers, or ice streams, lead across the rocky coasts to the sea. Many of these pass as tongues between sharply pointed mountain peaks and some reach picturesque fiords. Ice *calves*, or breaks off, from the most active ice tongues after reaching the sea, where detached blocks, some of huge dimensions, drift southward as *icebergs*. A few icebergs reach the active steamship lanes of the North Atlantic before melting completely.

Extensive ice cover exists on other Arctic

islands, such as Svalbard, Franz Joseph (Fridtjof Nansen) Land, and Novaya Zemlya, but these patches are neither extensive nor thick enough to be recognized as true icecaps. Their details are molded by surrounding and underlying topography. Many nunataks rise above their surfaces.

The ice of polar seas is quite different. Instead of being the product of snow accumulation, which is a solid form of fresh water, sea ice is formed by the freezing of saline, oceanic water. In favorable localities the onset of winter may initiate freezing that reaches a depth of fifteen feet or so before the Arctic night ends. In this initial, undisturbed stage it is called *floe ice*. But sea ice of the Arctic basin is not likely to remain undisturbed for long. It is in motion even in winter. Major drifts affect even the most remote parts of the ocean, while toward shores are winds, tides, and currents that combine to deform sea ice into chaotic masses called *pack ice*. Conflicting movements open large cracks, or leads, that may be initiated suddenly or as rapidly disappear as a result of squeezing. The pushing of ice masses against shores, or together, may build high ridges of ice lying block upon block.

Little open water remains in Arctic seas during the long winter, but melting is rapid toward shore when the summer sun rises a few degrees above the horizon. Rivers, lakes, and small waterfalls spring into being in irregular pack ice during the season of thaw. Open patches of green sea lead out for increasing distances from shore as wasting becomes general. By late summer only the central Arctic Ocean remains a solid expanse of ice. The melting, however, never progresses to the point where so much as half of the basin is water surfaced, and navigation for long distances along the coasts of the continents is rarely accomplished without interference from pack or floe ice.

VEGETATION

Any discussion of land vegetation of Arctic regions will of necessity consider the tundra almost exclusively, because only the lowly algae manage to grow on the icecaps or ice-covered seas. The tundra is the last stand toward the North Pole of all higher forms of plant life. *Alpine tundra* constitutes the last vegetation capable of surviving the rigors of climate at extreme elevation in lower latitudes. The number of plants in either polar or alpine tundra is comparatively small because conditions of growth are highly restricted by climate and ground conditions. Many species in these communities are found nowhere else,

while others are hardy invaders from lower or more southerly lands. All have survived an environmental struggle in which most plants would be destined to fail.

Among the unfavorable conditions that face tundra plants are cool, short summers with brief intervals between killing frosts; thin layers of poor soil immediately underlain by frozen ground; and unsatisfactory water supply. Many areas have an oversupply of water in summer and therefore are suitable only for aquatic or semiaquatic plants, while others suffer from dryness. Water is unavailable during the long season when it exists in frozen form. Dry winds evaporate moisture at excessive rates both from plant surfaces and from the ground in which the plants are rooted.

Many of the ways that plants combat the dryness of tundra environment are more or less paralleled by plants in the hostile desert. Some species grow small, leathery leaves. Others have leaves covered by small hairlike growths. These devices help reduce surface moisture losses. A number of plants are succulent, with pulpy flesh capable of holding considerable moisture, even though drought may be severe. Clump or tussock formations are common. Low stature and short stems permit plants to hug the ground so that they may absorb maximum amounts of heat while the sun shines and radiate a minimum of heat during darkness or when dry winds blow. Most plants are annuals with extremely short life cycles—seed production occurring a minimum number of days after germination.

Though true forest is absent, a few hardy trees such as birch, willow, alder, and mountain ash have managed to push north of taiga limits and reach the Polar World, where they grow as low, scraggly bushes, lying close to the protective ground. One extensive patch of low, deformed birch in southern Greenland has been dignified by the name "forest."

The most luxuriant vegetation grows where summer is warmest and water supply most adequate. Such places occur in the Aleutian Islands, some distance behind the coasts of North America and Eurasia, in parts of Greenland, and on a few other Arctic islands. The warm season witnesses rapid development of an almost continuous grass cover, which grows rankly and is colored by wildflowers. These *Arctic meadows* are green for only short periods, but while in full bloom are reminiscent of middle-latitude prairies.

A sharp reduction in vegetational luxuriance occurs toward coasts and around the margins of ice-covered land. Fewer species exist and the spac-

ing of individual plants becomes wider. Grasses and flower-bearing annuals give way to less conspicuous mosses and lichens. Favored positions for plant growth occur on south slopes, in depressions, and wherever the effects of desiccating winds are at a minimum.

Dry tundra surfaces provide rather pleasant walking conditions. Low-growing plants contribute to a moderate springiness that seems to shorten foot journeys.

Toward summerless, ice-mantled lands the vegetation is ever scantier and less conspicuous. Barren surfaces become the rule. Lichens and mosses assume about the same dark and drab colors as the rocks to which they closely cling. The life and color of blooming Arctic meadows lie far behind when proximity to the ice is reached. Once over the ice border, all higher forms of plants are missing. Only sporadically do algae redden snowbanks or pools of summer meltwater that lie scattered over flat ice surfaces.

ANIMAL LIFE

Ice-covered lands are nearly devoid of animal life, but both tundra and the sea support faunas rich in individuals, if rather impoverished as to number of distinct species.

It is not generally known that cold seas teem with animal populations far denser than those in tropical waters. Basic to the larger life forms is *plankton*, an assemblage of minute plants, mainly algae and diatoms, and microscopic animals, protozoans. Higher in the ascending scale of life forms are crustaceans who feed on plankton and, in turn, become the food of various shelled animals and fish. Larger mammals, notably whales and seals, live at the expense of fish. The sea-dwelling polar bear depends mainly on seals. Ranging widely across the ice far from shores is the Arctic fox, scavenger after the polar bear. Open summer seas invite countless waterfowl.

The most important fishing banks of the Polar World lie off the coast of Labrador and along the Murman Coast northeast of Scandinavia. These furnish the European World with great quantities of cod, halibut, and salmon. The plankton "meadows" of these northern waters are particularly rich, accounting not only for excellent fishing but also for the presence of whales and seals, who congregate along larger leads in sea ice and in open seas. Seals can maintain breathing holes through floe ice, but there are vast stretches of ice desert in the Arctic Ocean where none can be found. The polar bear remains rather close to shore as a rule, in the pack ice, where his food supply prospects are brightest. Summer may

and him many miles from land, but winter ordinarily sees him ashore. Ducks, geese, gulls, and other summer waterfowl remain near shore, where they nest and feast on either the abundant insects or the life that teems in shallow waters.

Tundra habitat is by no means so favorable to animal life as is the habitat of shallow seas. The land animal community is less rich, both in variety of species and numbers of individuals, yet it provides almost exclusively the basis of life for many Polar World peoples.

What plankton is to sea life, tundra vegetation is to the land animals of the Polar World. Edibility and abundance of vegetation is the prime control affecting land animal density. In conformity with plant distribution, the greatest abundance and variety of land animals occur in the inner tundra, rather than along cold coasts or in proximity to ice-covered lands.

Depending directly on plant resources are the herbivores: lemming, hare, caribou, musk-ox, and similar mammals. Indirectly dependent are the carnivores, predatory and parasitic, such as fox, ermine (weasel), wolf, and, toward the taiga, wolverine. There are land birds of mixed diet, such as the ptarmigan, owl, and snow bunting. Many summer waterfowl enrich the avian fauna

of the land. Not to be overlooked are innumerable insects: mosquitoes, flies, bees, butterflies, and the like. Herbivores harvest the vegetation; carnivores prey on the herbivores; flies and mosquitoes feast on both to make the short summer a time of torment. Largely independent of this intimate relationship is an abundance of freshwater fish life in lakes and streams. The latter is an important item in the diet of native peoples.

Animals exhibit many adaptations to polar life. White feathers and fur protect many, especially in winter. The Arctic fox, Arctic hare, ermine, and ptarmigan are conspicuous examples. Furs and feathers thicken during the cold season, and the caribou adds a layer of protective fat. A few animals spend the Arctic night in hibernation, in comparative dormancy. The end of summer finds many animals on migrations southward. Considerable numbers of insect-eating birds winter in the distant tropics. The caribou commonly seeks the protection of taiga forests; the wolf follows his migration.

To man, the most important land animal is the caribou. It provides excellent meat and skins unexcelled for winter clothing. The domesticated



Reindeer sledge in tundra (American Geographical Society)

variety, the reindeer, pulls sleds and is used as a riding animal. Among the Lapps it is milked; so that it fulfills functions of both horses and cattle.

The range of the caribou is circumpolar extending northward into some of the most remote Arctic islands and southward into the taiga. In social habit caribou are highly gregarious. As a rule they live and migrate in herds. Summer finds them grazing on tundra grass, while in winter, if nothing else is available, they may be reduced to nibbling on lichens. The great bulk of the caribou migrate, year after year, along the same general routes to the forest. Some interpret these migrations as motivated by desire to seek protection, but a strong possibility exists that the primary urge is hunger.

Thick, hairy coats and layers of fat protect the caribou against cold. Like qualities enable newly born calves to survive the bitterest of cold. Even

the young are fleet of foot and powerful swimmers, important items in any contest with their greatest natural enemy, the wolf.

The bulky musk-ox is even more at home in the Arctic than the caribou, showing absolutely no inclination to migrate toward the taiga in the fall. Feeding on grass and shrubs, his sole motivation for movement to other areas appears to be local exhaustion of food supply. Without natural enemies, he is fearless in a passive, bovine sort of way. The same instinct that causes him to stand against the wolf has made him ready prey to the rifle. For some thousands of years, the musk-ox has been restricted to North America. Man has reduced his range to such an extent that he is now found wild only in northeastern Greenland and remote Arctic islands. Recent appreciation of the value of the musk-ox as a source of food, hides, and wool has resulted in its reintroduction into northern and northwestern Alaska.

3: Polar World Cultures

Native ways of life in the Polar World are restricted by a nature that seems harsh and improvident. They are also restricted by *cultural heritage*, native inhabitants being unable to utilize fully the natural resources at their command because they and their forefathers have failed to acquire or develop suitable knowledge or techniques. A natural resource becomes valuable only when used. Deposits of coal and iron are worthless as they lie beneath the earth's surface. They became valuable to man only when he began to mine them for use as a source of power, in one case, and as his most useful metal, in the other. These natural resources have had value only during an extremely small fraction of the time man has inhabited the earth, and then only to limited groups of people. The peoples of the Polar World were slow to acquire many skills that seem commonplace to the European or Oriental, but their cultural heritage includes many skills that are practically unknown to Europeans. Europeans may readily overlook resources important to Polar World peoples, just as Polar World peoples

neglect to use resources that are valuable to Europeans.

Nature provides Polar World peoples with an abundant sea life, fairly abundant land-animal life, and many rich deposits of minerals. It imposes a harsh climate, a paucity of wood, an insufficient supply of vegetable food, and an environment very unfavorable to densely grouped populations.

It is not surprising that there is considerable uniformity in ways of life among all native populations of the Polar World. Severe limitations in natural resources narrowly circumscribe the range of opportunities open to Polar cultures and generally relegate them to primitive levels. *Diffusion* of culture traits, or the spreading of knowledge of inventions and practices from one group to the next, has also worked toward producing and nurturing cultural similarity. *Isolation* from other culture worlds is maintained by the broadness of the taiga.

Common to all Polar World peoples is dependence upon animal life and very limited use



Chukchi settlement (N. A. de Transehe)

of vegetable foods and fibers. There are gross similarities in clothing, houses, tools, and weapons. All use the sledge for travel. In common with many of the simpler peoples, economic relations verge on a primitive communism. Surprisingly, life is relatively carefree and definitely good-natured. Political organization is the bare minimum required by relationships within the tribe. Prosperity and hardship affect all alike. There is neither individual destitution nor wealth differing much from that of close associates.

Hunting and herding as ways of obtaining a livelihood can support only a sparse population, without congregation in large settlements or cities. Hunters and herders must be at least partially nomadic. They must be able to move in order to find more abundant game or better grazing. Nomadism by no means implies aimless or unrestricted wandering. It ordinarily signifies regular visits, at particular seasons, to various places within a definitely restricted territory.

Another unifying trait of Polar World peoples is that practically all are more or less Mongoloid. The darkly pigmented skin and coarse, straight, black hair of the so-called "yellow race" is almost universal. This racial unity does not mean unity of language. The diversity of tongues is astonishingly great in the Eurasian part of the Polar World.

Despite the many broad similarities in culture among peoples of the Polar World, there are several well-marked differences. These separate peoples into various culture groups occupying individual culture regions. The sharpest distinctions of all necessitate the division of the Polar World into two main culture realms, Eurasian and American. The outstanding distinction between the realms lies in the fact that the peoples of the Eurasian realm are mainly hunters of land animals and herders of reindeer, while those of the American realm are mainly hunters of sea mammals. This fundamental contrast in ways of life drives Eurasian peoples inland, whereas the sea-mammal hunters of America congregate along coasts. There are some exceptions to this primary distinction. They are useful in showing that the difference is not the result of significant environmental contrasts between realms, but rather is a matter of human choice.

EURASIAN REALM

The Eurasian realm of the Polar World extends along the tundra from north-central Norway to easternmost Siberia. It is occupied by a

number of loosely organized tribes and tribal groups, chief among which, from west to east, are: Lapp, Samoyed, Ostyak, Tungus, Yakut, Yukagir, and Chukchi. In all, they number fewer than 30,000, a handful of people thinly spread over an enormous territory. Their languages are complicated and highly diverse.

Most Eurasian tribes avoid the cold, foggy coast. In late summer they ordinarily migrate to the protection of the taiga border to gather roots, tubers, and berries. Considerable use of wood occurs in their tools and implements. In winter the common dwelling is a solidly covered pit dug into the ground. Long sledge journeys are undertaken both in summer and winter, for runners slide about as easily over mossy tundra as over winter snow or frozen ground. Early summer finds the tribes moving northward into the tundra, where they live in movable skin tents.

The most distinctive culture trait of Eurasian tribes is the breeding and utilization of the reindeer. This animal was domesticated several thousand years ago from the wild caribou of central Asia. Its adaptability to the tundra, its usefulness as a draft animal, the excellence of its flesh, and the utility of its hide led to its widespread adoption by Polar World tribes, so that it became the "cattle of the North." Many practices associated with use of the reindeer were borrowed from horse-and-cattle-using peoples to the south, such as milking, gelding, the use of the lasso, and riding. Hitching the reindeer to sledges was quite possibly an adaptation from earlier use of the dog sled.

The treatment and use of the reindeer differ in various parts of the Eurasian realm. The Lapps, probably as a result of long contact with European peoples, have most thoroughly domesticated the animal. Reindeer cows are milked regularly and animals are treated in the gentle manner practiced by Europeans with their cattle. Farther east, among central Eurasian tribes, reindeer are used chiefly as transport animals and as aids in the hunting of wild caribou. Still farther east, half-wild reindeer are held loosely in large herds, mainly to have them available when flesh or skins are needed.

The life of native tribes in the Eurasian realm is largely regulated by seasonal movements of reindeer herds to open tundra in summer and toward the protective forests along streams or the taiga border with the approach of each year's short autumn, a pattern that follows the instinctive migrations of the wild caribou. The tribesman everywhere supplements his reindeer diet with such wild plant foods as each habitat may yield. During the long winter he spends much time in

his warm house making articles of the wood provided by the adjacent forest.

AMERICAN REALM

The American realm of the Polar World laps over into easternmost Siberia, from whence it extends to Labrador and Greenland. It is the land of the Eskimo, of whom there are some 30,000. It has but one main language and possesses cultural unity to a very high degree. The culture is primarily coastal.

The Eskimo are hunters and fishermen with no domesticated animal other than man's most universal adoption, the dog. They make exceedingly little use of vegetable food. In contrast with Eurasian tribes, their habitations are almost wholly along coasts, in small groups. Population spreads thinly, not only along the mainland but even to islands of the polar sea including the inhospitable shores of eastern Greenland. An isolated group living on the shore of Smith Sound, at Etah, Greenland, is the northernmost people in the world.

The seal, in all varieties from smallest to the giant walrus, is the main basis of Eskimo economy. It provides food, oil, skin, bone, and ivory. Dependence on the seal holds the Eskimo to chilly coasts. Only seasonally does he venture inland to hunt caribou, and this primarily for the purpose of getting skins for clothing.

Like other hunters, Eskimo are nomadic. Winter drives them into substantial houses made of sod or stone, or snow houses when traveling. Skin tents serve as shelters in summer. Truly *sedentary*, or definitely fixed, settlements are to be found only in western Greenland, but even there the population scatters for summer hunting and fishing.

The Eskimo had no practical precedent of a people living by the polar sea, where little or no wood existed, and where the basis of livelihood consisted mainly of sea animals. Hence they had to devise unique tools and procedures to supplement the limited cultural heritage they brought from their original habitat in northeastern Asia. They developed and were the exclusive users of the kayak and umiak, skin-covered boats admirably suited to hunting and transportation in the polar seas. They perfected an oil-burning stone lamp for cooking and heating. Their discovery of the principle of the vaulted dome, as used in building snow houses, entitles them to high rank in the scale of inventive genius. Even the highly civilized plateau dwellers of Middle and South America, with a beautifully developed architecture, failed to make that particular discovery.

Eskimo devices made life not only possible, but quite comfortable as well, in an environment offering only extremely limited possibilities.

The yearly cycle of Eskimo activities depends mainly on seasonal changes and the availability of game. During the long, cold Arctic night he is ordinarily established in small settlements near the coast. Hunting at this season is chiefly an individual matter, sporadic because of bad weather and unfavorable ice conditions. It is warm and comfortable within winter homes and much time is spent sleeping and in eating large quantities of fat, frozen, and sometimes rotten, raw meat. Winter is the season for sport, ceremony, and sociability. Sledge journeys of hundreds of miles are undertaken, sometimes in search of food, but often merely for the purpose of visiting some distant friend or relative.

Spring bustles with activities of a more serious nature. Seals, walruses, and whales appear in the opening seas. The main season for hunting is soon in progress. Waterfowl arrive, and their eggs offer welcome variety to a rather monotonous diet. Summer appears all too soon. Winter dwellings are abandoned in favor of mobile, skin tents, and villagers scatter to gather driftwood or dig fossil ivory out of frozen ground. Some parties journey inland, in search of caribou or musk-ox.

The return to winter quarters in fall may find an Eskimo rather widely removed from the place where he spent the previous Arctic night. New houses are prepared. The long, dark season is contemplated not with dread, but with anticipation. There will be an absence of insects, and the social activities of winter are again in prospect.

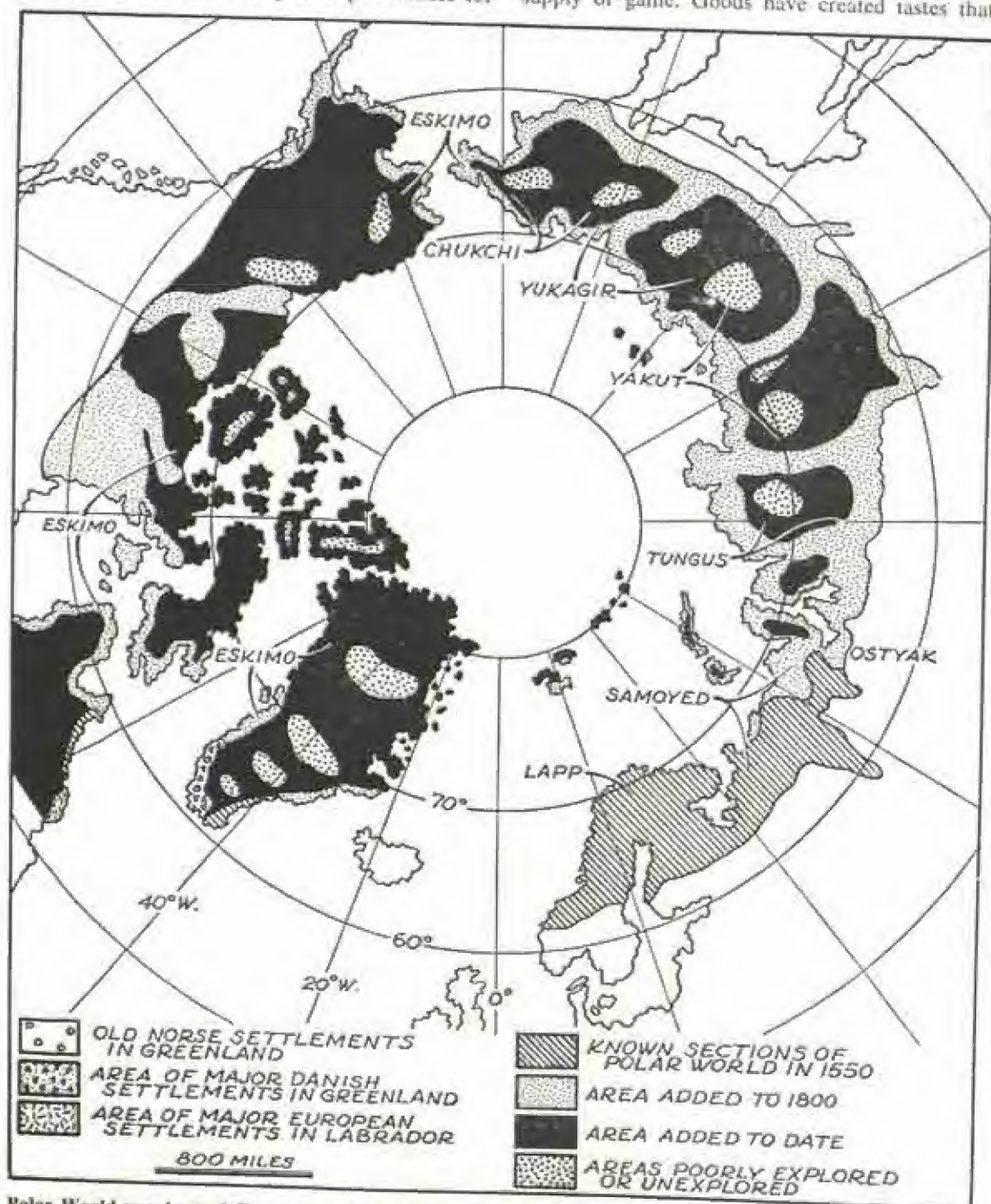
EUROPEAN CONTACTS

European knowledge of the Polar World dates back at least to the time of classical Greece. Pytheas of Massilia, in about 325 a.c., is credited with a trip to inhabited Thule; he brought back stories of the midnight sun and other tales that were in the main unbelievably by his contemporaries. His Thule was probably Norway, but the concept of Thule has since then been driven back to ever more remote lands, finally coming to rest in *ultima Thule*, Greenland.

Though the North has long been known to Europeans, their interest has not been continuous, nor consistently directed toward the same objective. Waves of enthusiasm have brought explorer, missionary, trader, trapper, miner, adventurer, scientist, fisherman, and even exile settler to various parts of the Arctic. Almost without exception,

none has permanently adopted Polar World ways. Of these groups, only some missionaries and scientists deserve exemption from classification as exploiters. To most Europeans, polar lands are attractive only because they offer possibilities for

pecuniary profit, or exploitation for personal fame and glory. The natives have suffered from most European contacts. Lethal diseases have appeared with the European. Ways of life have been thrown out of balance through the introduction of firearms and new goods. Guns have reduced the supply of game. Goods have created tastes that



Polar World peoples and European exploration

have destroyed much of the natives' independence.

Some of the earliest European contacts with Arctic lands resulted in permanent settlements. Irish who arrived in Iceland at some date prior to A.D. 795 and Scandinavians who began appearing in the ninth century remained as founders of a permanent part of the first main westward extension of European World culture.

Iceland became the bridgehead for explorations that ranged from Newfoundland to Novaya Zemlya. Prior to the year 1000, Eric the Red established settlements on Greenland and shortly thereafter his son Leif reached the mainland of North America. His party may have been the first Europeans to reach the new continent, but that is by no means certain. Others may have preceded the Northmen.

The Voyages of Discovery at the close of the Middle Ages found Europeans searching in various directions for routes to India and China. When it was realized that America blocked the path to the Far East, many attempts were made to find practicable passages around its northern shore, the long-sought Northwest Passage, or back along the northern coast of Eurasia, the Northeast Passage. These attempts led Europeans directly into the Polar World.

England took the lead in the search for passages to the Far East in the middle of the sixteenth century to be joined later by the Dutch, Russians, Scandinavians, Americans, and others. Though extending over an interval of several centuries, contacts between sporadic explorers and peoples of the Polar World were neither frequent nor intimate enough to bring about any marked cultural disturbance. Most significant were the activities of Russian Cossacks, who reached the Siberian coast during the latter part of the sixteenth century, developed a flourishing fur trade, and obtained knowledge of the great rivers that discharge into the Arctic along the northern shores of Asia.

The rewards of polar exploration have come slowly. Only after some three centuries of intermittent effort was actual passage by ship through the Northeast Passage accomplished, by Norden-skiöld's "Vega," 1878-1879. Not until 1903-1906 did Amundsen force his tiny "Göja" through the Northwest Passage. Discovery of uninhabited Siberian Arctic islands has been a slow matter. Franz Josef Land was not found until 1872-1874, Northern Land not until 1913.

Search for new routes or lands in the Arctic started mainly as a practical commercial enterprise. It gradually became exploration, sometimes with definite, legitimate scientific objectives, but often only with motives no more serious than

"stunting" to enhance the fame of individual explorers.

EUROPEAN SETTLEMENTS

Of the many Europeans who journey into the Polar World, few do so with the idea of adopting permanent residence or of abandoning European ways of life. It is interesting that the first groups of Europeans to venture in rather large numbers into the Arctic went as settlers, first in Iceland and thence to Greenland.

Political exiles under Eric the Red moved to the southern part of Greenland's west coast in A.D. 984. Norse settlements spread northward between the tenth and twelfth centuries to at least 20 miles beyond Upernivik, or some 350 miles beyond the Arctic Circle. Scattered archaeological remains have been found still farther north. The Norse found the remains of Eskimo settlements but no living Eskimo in southwestern Greenland. Soon, however, Eskimo were encountered on the Labrador coast and on the northern coast of western Greenland.

The Scandinavians lived in small settlements where they reared cattle and lived much after the contemporary fashion in northern Europe. An annual ship long maintained contact between Iceland and Europe; less frequent voyages kept rough touch with the Greenland colonies.

The end of the first European settlement period in Greenland came with the cessation of contacts with Iceland during the fifteenth century, probably not very long before Columbus "discovered" America. Some seventy-five years had elapsed between the last two known voyages of ships from Iceland. The title, "Bishop of Greenland," held by successive priests in Denmark, had little meaning for many years.

The second and existing period of European settlement was initiated by Hans Egede, who went to Greenland in 1721 for the purpose of finding the Norse colonies and to convert the Eskimo to Christianity. No descendants of Europeans were found, but Eskimo of largely pure culture and somewhat mixed blood were living where the Norse colonies had been. This and other evidence suggest that the isolated Europeans were gradually absorbed by the Eskimo, both culturally and racially.

Greenland's modern history provides one of the few examples of wise administration of a native people of another culture world by Europeans. Some 600 white Europeans dwell among 21,000 natives in a political organization consisting of

12 districts and 62 communities. Strict control of all contacts with Europeans has kept the introduction of epidemic diseases to a minimum and has permitted the natives to increase in number from 6,000 in 1805 to the present 21,000. These people are mainly mixed Mongoloids and Caucasoids and are properly called "Greenlanders." Pure Eskimo are to be found only in isolated settlements, such as at Etah, far to the north, or at some inhabited localities on the east coast.

The culture of the Greenlanders is also mixed—European and Polar World elements being blended. Low stone and turf houses appear among wooden churches, schools, and trading posts. The southern villages maintain cattle and even small gardens, where potatoes, broccoli, lettuce, and other hardy crops grow successfully. European culture traits such as the use of tobacco and coffee and reading of newspapers are part of the natives' mixed culture. However, the dog sled and kayak stand foremost among tools of existence, and seal hunting remains the primary basis of life. In spite of closer contacts with European ways during winter, when life is sedentary, summer finds the Greenlanders roaming widely in search of food in about the same way that their Eskimo ancestors did before the Europeans arrived.

The barren coast of Labrador has long been settled by small groups of Europeans. Once occupied exclusively by Eskimo, the section south of Hamilton Inlet has become entirely European. Interspersed among the Eskimo north of the Inlet are several small towns founded originally as Moravian missions: Nain, Okkah, and Hopedale are the oldest. The inhabitants of these towns are mainly missionaries, traders, and fishermen who came without intention of remaining permanently. Life is wholly European and most necessities are imported from the outside.

Most of the permanent European inhabitants of the southern coast of Labrador are fishermen. Agriculture and livestock have virtually no place in their economy. Unwilling and unable to adopt appropriate ways of life and live as Polar World peoples, these Europeans suffer from maladjustment and malnutrition. A diet consisting chiefly of fish, imported flour, molasses, and tea fails to maintain robust health and physical vigor.

Permanent towns and cities of European origin have been established along the Eurasian sector of the Arctic during recent years. They serve as transfer points for local exports and in a limited degree for imports. Most are located at or

near river mouths and their commerce is mainly of non-Arctic origin. Some on the European coast are termini of roads or railroads. Those on the Siberian coast are ports where goods brought by river boat or rafting are loaded on ships destined for Archangel or other Soviet manufacturing centers.

Murmansk, the largest of Arctic ports and most populous city in its latitude, 68° 50' N., although squarely within Polar World territory, has an ice-free harbor. Enough warm water passes North Cape to drift along the Murman Coast and maintain this condition. The railroad leading south to Leningrad is ordinarily busiest in winter when more southerly Russian ports are ice bound.

The Arctic ports of the Soviet Union are European in appearance and function. They are not an outgrowth of their Arctic environment, nor are they sustained by it. Greenhouses that produce fresh vegetables are an interesting luxury, but bring little reduction in the necessary importation of virtually every item needed to maintain European ways of life.

The European sector of the Arctic is composed chiefly of extremely old rocks formed long before there was vegetation on earth and hence devoid of coal. Maintenance of European population is therefore expensive, particularly if fuel must be brought in from long distances. The Soviet Union has remedied fuel deficiencies to a considerable degree by installing numerous hydroelectric power stations. Many of these serve Arctic ports. Others serve mines and are becoming local centers of industry.

EUROPEAN EXPLOITATION

The European settlements in Greenland, Labrador, and along Soviet coasts are places where individuals reside more or less permanently and where families are raised to become members of European culture communities. Not differing greatly are many *factories* or trading stations, mining camps, administrative posts, and fishing or whaling centers located primarily for purposes of exploiting natural resources, where residence is ordinarily considered temporary.

Whaling and sealing brought Europeans to Svalbard before the year 1600. The depletion of whales in North Atlantic waters sent hundreds of vessels to waters off Arctic North America. During the big era of whaling in the nineteenth century, Americans and British realized over a billion dollars. The substitution of steel for bone in making corset stays and similar objects and the use of kerosene for illumination instead of whale oil rendered whaling less important; however, a mod-

ern revival in other waters returns handsome revenues, especially to Norway.

Whaling, in spite of numbers of Europeans involved, left few changes in Polar landscapes. Important stations at such places as Svalbard in eastern waters, and Barrow, Herschel Island, and Baffin Island in western waters, flourished and disappeared completely. The more lasting effects of whaling are those affecting natives of the Polar World. Disease and decimation remained in the wake of whalers, as well as new tastes that could be satisfied only with imported goods.

The course of commercial sealing has run parallel to that of whaling. The gregarious nature of many species of seals and their habit of congregating annually at the same places tended to concentrate and localize commercial exploitation. Activities were centered to the northeast of Newfoundland, around the entrance of the White Sea, and in the Greenland Sea between Greenland and Svalbard. Declining yield and loss of market for hides and oil have reduced the importance of seal fishing in recent decades.

The northern fur seal of Bering Sea is a distant relative of other Arctic seals. He is valued primarily for fine fur. Overhunting reduced these seals almost to extinction. Government regulation of the annual catch is calculated to assure future supplies of their fine pelts and to maintain the industry.

Furs of land animals found their way from the Polar World to such places as the eastern Mediterranean at least twenty centuries before the era of the Voyages of Discovery. Explorers

have ever trekked north in their search of furs. In more recent centuries the demand of Chinese markets brought Russian trappers and traders across Siberia and into Alaska, while the European market sent Englishmen to Hudson Bay and Russians to Arctic Eurasia.

Fur traffic established the oldest Arctic trade routes. One extended overland across the southern edge of the tundra of European Russia. Cossack leaders opened Siberian rivers to traffic in the seventeenth century in order to bring furs and fossil mammoth ivory from the tundra. Sea routes to Taimyr Peninsula, both from east and west, have been used by unnamed traders for centuries.

First-order commercial enterprises have arisen in the fur trade. The Russian-American Company, organized in 1788, controlled the fur trade of the Aleutians and other parts of Alaska prospering mainly on profits derived from the now nearly extinct sea otter. The Hudson's Bay Company began operations in 1670 and has never relinquished its hold on the Canadian Arctic. Even now it is expanding its network of posts to the Canadian Archipelago, where the catch is principally the Arctic fox.

Though explorers have long been interested in the mineral wealth of the Arctic, most commercial exploitation is of recent date. To permit the expense of transportation to distant markets, minerals must be highly concentrated or extremely valuable.



Russian outpost in northeastern Siberia (N. A. de Transche)

Rich gold placer deposits were discovered in the bleak tundra near what is now Nome, Alaska, in 1899. Almost overnight a tent and sheet-iron city sprang up to house an influx of some 12,000 gold seekers. Production reached \$7,500,000 in 1906 but declined sharply after a brief period. Nome now has a population of about 2,200. Agriculture and industry failed to develop in such an environment. Necessities of life on the European basis maintained by the mining community could be supplied only from distant sources. All supplies were expensive.

Less spectacular is the Danish-settled mining community of Ivigtut in southwestern Greenland. Here are the world's richest deposits of cryolite, a mineral used in the smelting of aluminum. Like Nome, Ivigtut will fade when the supply of cryolite fails or when demand comes to an end. New processes have seriously threatened the cryolite demand in recent years.

Coal mining began commercially on the western island of Svalbard in 1905. Whalers had dug the coal in small amounts in the early seventeenth century, but British home production seemed adequate for the needs of peoples who could be served by colliers, and many years elapsed before anyone seriously considered going so far as the vicinity of the eightieth parallel for so bulky a commodity. It has now been found that Svalbard contains not only large deposits of near-anthracite coal but also commercial quantities of gypsum, asbestos, iron ore, and marble. It is thought to offer petroleum possibilities as well. Distance is no great barrier to exploitation of bulky minerals at present, provided that they are located near coasts and available to cheap water transportation. This is the case during about four months of the year in Svalbard. Norway's ownership of Svalbard, formally recognized by other nations in 1920, is a boon to that mineral-poor country. Bear Island, another Arctic possession of Norway, has deposits of coking coal. These islands reduce Norway's dependence on foreign sources of mineral fuel.

A modern era of prospecting and mining with the aid of the airplane has been ushered in since 1935. The most notable achievement of the new methods has been the discovery and mining of pitchblende deposits of the eastern Great Bear Lake district, Canada. The world market for radium was saturated as a result of the successful operation of these remote mines, and North American countries were provided with the world's best known source of uranium for the production of atomic energy.

Considerable gold mining is occurring in Arctic Siberia, but its details are little known outside of the Soviet Union.

Many important mineral deposits of the Polar World now occupy that uncertain position of being discovered but as yet unexploited. These include great quantities of petroleum and coal in Alaska, copper and iron in Canada, anthracite and copper in Novaya Zemlya, and placer gold in the Chukotski Peninsula of eastern Siberia. Rapid strides in invention and discovery may make it quite unnecessary to go to the Polar World for many bulky and inaccessible minerals, but it is somewhat comforting in an age of such rapid mineral exploitation generally to know that they exist.

RÉSUMÉ

Gauged by the fundamental yardstick of its ability to provide the basic necessities of life, food, clothing, and shelter, the environment of the Polar World is harsh and niggardly. It offers to man a rich sea fauna, a fairly abundant land fauna, but denies significant agriculture and anything but a meager supply of wild plant food. It imposes a severe climate that demands much in the way of clothing and shelter and is highly restrictive on out-of-doors activity.

A sparse population, largely Mongoloid in race but diverse in language and to some extent in culture, has devised methods of living successfully and even comfortably in this restricting environment. The peoples of the Eurasian realm are mainly herders of reindeer and hunters of wild game. American tribes are dependent chiefly upon the life of the sea. In one realm people seek the inner border of the tundra, and in the other, the coast. The close and direct dependence of Polar World peoples on nature and the simplicity of their material cultures require little modification of natural landscapes. Nature in its alternate monotony and grandeur is relatively undisturbed.

Europeans have invaded the Polar World for many reasons. Furs and whales were early attractions. Fish and minerals are leading products today. Ivory, important to natives in lands where adequate supplies of wood were lacking and where people were unable to make much use of metals, has long trickled southward as a luxury item among Europeans. Scientific curiosity drives an increasing number of people into the Arctic. Little-known regions tempt the map maker. Recently it has become widely known that Arctic borders are theaters of atmospheric changes that affect weather throughout more temperate lands. Meteorologists and geophysicists have been stationed at many northern outposts, particularly

in the Soviet Union, to keep track of physical changes that have important forecast value for lands farther south. The American sector of the Arctic lags far behind the Soviet sector in the development of contemporary scientific knowledge.

The Air Age has directed attention to the Polar World in rather spectacular ways. Flights of Nobile, Amundsen, Wilkins, Byrd, and others have re-emphasized the truism that the shortest distances between important Northern Hemisphere centers lie along routes crossing the Arctic. It hardly follows that great development of airports and commerce will result in other than borderlands, such as Iceland, Newfoundland, Alaska, and Siberia. American and Soviet interests are attaching considerable importance to the strategic values of such places as Svalbard and Greenland.

Realistic but largely untested is the proposal that tundra pastures be used to produce reindeer and musk-ox meat for the world market. The main obstacle may lie in converting a public accustomed to eating beef, pork, and mutton.

Few proposals for Arctic development are vitally concerned with the Polar World native. He has cheerfully accepted an outside religion, and tools, weapons, and foods which seem better than his own. In turn, he has paid a severe price for European contacts in terms of dwindling game supply, contact with new diseases, and vital dependence upon items that his environment is unable to produce. It is impossible that he adopt European culture entirely, for his milieu does not permit sedentary agriculture, which is basic to European ways of life. The cultural upsets in store for the Polar World promise to increase satellitic relationships to the European World. Viewed from the white man's standpoint, Polar World inhabitants are becoming an increasing responsibility and burden, a charge that becomes heavier in proportion to the rapidity with which the New World Revolution progresses, and Polar World culture traits are replaced by those characteristic of the European World.



Small air base in Greenland (U.S. Army photograph)

EUROPE

4: Small but Diverse

In the fifth century B.C., Herodotus wrote, "I wonder, then, at those who have mapped out and divided the world into Libya [Africa], Asia, and Europe. . . . Nor can I guess for what reason the earth, which is one, has three names, all of women. . . . Thus far I have spoken of these matters, and let it suffice; we will use the names by custom established."

Europe is a continent by "courtesy" and tradition. Physically it is nothing more than a group of peninsulas in western Eurasia. Africa is part of the same general landmass, the great Eastern Hemisphere continent, because it lacks natural water separation from Asia. Though some speak of an Afro-Eurasian landmass in the Eastern Hemisphere, we, like Herodotus, are likely to "use the names by custom established." We must consider the question of Europe's artificial eastern boundary, just as he did over 24 centuries ago.

EASTERN BOUNDARY

To the ancients the Sea of Azov and the Don River were the most commonly accepted eastern boundaries of Europe. In recent years it has become customary to accept the Ural Mountains, Caspian Sea, and either the Caucasus Range or the Manych Depression to the north between the Caspian and the Sea of Azov. These physical features are definite enough, but at either end of the Urals topographic distinctions are less clear and various choices have been made from time to time. To the north the boundary has been considered both as extending along the Pai-Koi Range toward Vaigach Island and Novaya Zemlya and along various routes to Baidaratskaya Bay on Kara Sea. To the south it has been run along the Ural River, or by other routes to the Caspian. The current Soviet interpretation is extremely irrational and complicated, being wholly political in origin. If the Soviet Republic of Kazak is considered as being wholly Asiatic, the boundary between the two continents crosses the Ural River several times and toward the Caspian roughly parallels the Volga for about three hundred miles reaching that sea on the eastern side of the Volga delta.

Europe and the extent of the European World are totally different concepts. The eastern boundary of the "continent" has almost no cultural significance. Various peoples have crossed the Urals freely for thousands of years and have carried culture traits with them. On the whole the more important movements have been westward, but in recent centuries the tide has turned, so that Europeans and European ways of life now extend beyond the mountains as a "wedge" across Siberia to the shores of the Pacific. The European World has outgrown its continent in that, and in many other directions. The Mediterranean has proved ineffectual as a barrier to culture migrations to the south. The better watered parts of north Africa have come into the European World. There is a similar overflow into Asia Minor, recently expressed by such events as the adoption of an European alphabet by the Turks. The New World Revolution has witnessed introduction and permanent adoption of European ways of life across all oceans.

SIZE AND SHAPE

In area, Europe is exceeded by all other continents except Australia. Relative areas are indicated in Table 1.



Eastern boundaries of Europe

Table 1 Areas of continents

	Sq. mi. (millions)	Percent of world's continental area
Asia	16.49	29+
Africa	11.53	20+
North America	9.36	17-
South America	7.10	13-
Antarctica	5.36	9+
Europe	3.78	7-
Australia	2.97	5+

In shape, Europe is extremely irregular. Despite the fact that nearly one third of its perimeter, along its Asian boundary, fails to touch oceans or seas that are connected with the world's ocean system. Europe ranks with Australia as leading other continents in length of exterior sea-coast in proportion to total land area.

Table 2 Proportionate lengths of coastline on water connected with oceans, in ratio to total land area

Europe	10	Eurasia	6
Australia	10	South America	6
North America	8	Asia	5
Antarctica	7	Africa	4

Europe's long coastline results from such deep indentations as the Mediterranean and its many ramifications, the North, Baltic, White, and other seas. Caspian coastline is not taken into account in Table 2. If included, Europe outranks Australia by a small margin. If only useful coasts are taken into account, Europe stands far to the fore among continents, because nearly all of its coast provides harbors that are suitable to development into commercial ports, whereas Australian coasts are economically useless for vast distances.

The shape of Europe is so irregular that only a small fraction of its western part lies over 300 miles from an exterior coast. Only in the heart of Soviet Russia does any considerable territory lie more than 500 miles from ocean-connected seas, and no place lies as much as 1,000 miles inland, or as far as Minneapolis from either the Atlantic or the Gulf of Mexico.

Europe's long coastline is one of the continent's greatest assets. It helped develop cultural unity. It stimulated commercial and political activity. A commercial advantage will always exist for the reason that the cheapest transportation is always over water. Long overland hauls are reduced to a minimum. Proximity to the sea moderates temperature and tends to create more equable precipitation distribution. Coasts favor fishing and all other marine enterprises. Not without considerable spiritual and aesthetic value is the scenic attraction of coastal lands.

GREAT MOUNTAIN BARRIER

The main physical subdivisions of Europe depend on the presence of a great, east-west mountain barrier across the southern part of the continent. This is the western end of a highland system that extends across Asia to eastern China, and to the many great chains of southeastern Asia. To the north of Europe's major mountain barrier lies the European Plain, and to the south, the Mediterranean peninsulas.

The westward terminus of the great east-west Eurasian mountain barrier is Cape Finisterre, the northwestern corner of the Iberian Peninsula and sea end of the Cantabrian Mountains. The narrow coastal strip along the Bay of Biscay north of this range has always been culturally oriented northward, whereas interests in the rest of the peninsula have faced alternately eastward, southward, and westward.

East of the Cantabrians, between Iberia and France rise the Pyrenees so high, rough, and inaccessible that it has been said often, "There are two ways to cross the Pyrenees, one at either end of the range." This is true enough commercially, because principal rail and main highways are thus restricted, but it is an exaggeration otherwise, because passes do exist. The Pyrenean cultural barrier has been so pronounced that the idea, "Africa begins at the Pyrenees," has considerable merit.

A break exists in the mountain barrier across southern France, where the Cévennes and Massif Central (Central Plateau) may be likened to a plug that fails on either side to fill an opening. To the west of the plug is the gateway of Toulouse (or Carcassonne), an easy passage between the Mediterranean and lowlands flanking the Bay of Biscay. To the east is the Rhone Corridor, a valley leading northward across the Pass of Belfort to the Rhine Valley of southwestern Germany, or by various routes to Paris and lowlands flanking the North Sea. Roads, highways, and canals lead through these gaps in the mountain barrier. Peoples and goods have always moved freely across France. Mediterranean culture traits have diffused northward more readily through these breaches than across the barrier at other points.

Alpine ranges cut off the Italian Peninsula from the rest of Europe. Near the Mediterranean coast and long a barrier to cultural admixtures between France and Italy are the Maritime Alps. Culminating summits rise to about 10,000 feet. Valleys are deep, local relief great, and the territory rugged. These characteristics are emphasized northward, where peaks along the French-Italian border rise to elevations in excess of 12,000 feet. Mt. Blanc, the highest summit in western Eu-

rope, with an elevation of 15,781 feet, lies in French territory a short distance south of Switzerland. Many Swiss peaks rise above 13,000 feet and Monte Rosa reaches 15,217.

On the whole the Alps have much the shape of a gigantic fishhook with its shank directed eastward toward Vienna. The barb of the hook lies along the Ligurian coast of Italy and the bend swings through the Maritime Alps to Switzerland. The several parallel ranges of the rather straight shank are commonly lumped together under the name Eastern Alps. Tirol generally describes the region toward the base of the shank just east of Switzerland. Trans-Alpine crossings everywhere involve journeys through high, narrow passes, or, in recent times, long tunnels. As the Alps lie mainly north of 45° N. in latitudes equivalent to those of the northernmost parts of the United States, the timberline stands rather low according to our standards; and the vertical extent of territory above it looms large. This is one of the reasons why the Alps appear so rugged and why *alpine* has come to be a descriptive adjective referring to lofty regions.

Many separate ranges and highlands extend southeastward from the Alps to territory between the Adriatic and the Danube. These spread like fingers along two major and several minor trends. A major trend leads from the Eastern Alps through the highlands of Yugoslavia and the Pindus Mountains of Greece, along various islands to Crete. A minor trend leads to the Chalkidike (Chalcidice) Peninsula at the northwestern corner of the Aegean Sea; another to the Rhodope Mountains to the north of the Aegean. The Balkan Mountains, south of the Wallachian Plain of the lower Danube, establish a major trend in this highly complicated part of Europe. This range is directed eastward toward the Black Sea.

MEDITERRANEAN PENINSULAS

South of the great east-west mountain barrier are the Mediterranean lands of Europe consisting mainly of three large peninsulas. Here is rugged territory in which comparatively small flat areas



Mountains and gateways of Europe

are isolated by steep hills and mountains. Difficulties of overland transportation have favored use of the sea by Mediterranean peoples, even in prehistoric times, so that islands are about as accessible as localities on the mainland, and places most closely related culturally commonly lay across bodies of water. Sharp cultural contrasts exist almost side by side in terms of airline distance on land, because many topographic barriers were rarely crossed by the people on either side.

The Iberian Peninsula, south of the Cantabrians and Pyrenees, consists mainly of a high, dissected plateau, the Meseta. The evenness of the plateau is broken both by ranges rising to greater heights and by valleys that have cut so deeply that residual highlands are left standing between them. Most of these features trend about east-west, conspicuous examples including the Sierra de Gata, Sierra de Gredos, Sierra de Guadarrama, and Montes Universales, of central Spain, and the more striking Sierra Morena and Sierra Nevada to the south. Mulhacén, the culminating peak of the latter range, rises to a height of 11,420 feet and a considerable area lies above the 10,000-foot contour, so that in spite of location in almost the southernmost part of Europe, the jagged Sierra Nevada (Snowy Mountains) actually deserve their name; snow covers their crests for long periods each year. The most important Iberian lowlands are the Plain of Aragon in Catalonia south of the Pyrenees; the coastal plain and Tejo (Tagus) River plains of Portugal; the broad Andalusian (Andalucian) Plain of southwestern Spain; and the Valencian and other coastal plains along the Mediterranean east coast.

The Italian Peninsula is divided into several lowland regions by the Apennines. This range is connected with the Alps by the Ligurian Hills along the Gulf of Genoa. Instead of extending directly down the peninsula as a backbone, the Apennines cross to the Adriatic side about halfway down and then swing back to the west coast in Calabria to become the toe pointing toward Sicily. Italy's most extensive lowland, the Po Valley, lies between the Alps and the Apennines.

The Grecian Peninsula is extremely irregular both in plan and relief. Lowland areas are very small and occur mainly in the north and northeast. Coasts are deeply indented along former valleys that have been *drowned* by the rise of encroaching seas. Areas that were formerly land valleys have become elongate bays or estuaries. Former hills have become islands. Old ridges are now chains of islands, such as the Ionian group

along the west coast, or the Cyclades in the Aegean.

CENTRAL UPLANDS AND MOUNTAINS

Broad plateaus and uplands of various sorts flank the northern side of the great east-west mountain barrier. The plateau zone in France is both wide and rugged. Northward, in Switzerland and southern Germany, plateaus are less rugged, as in the Jura and Alpine foreland. Offshoots extend northward across eastern France to the Ardennes Plateau of Belgium and along the eastern side of the Rhine Valley as the Black Forest (Schwarzwald) to the Harz Mountains of Germany. Most of the territory along the Rhine is dissected plateau, in which valleys are cut rather deeply between comparatively flat residual highlands.

The main highlands of central Europe lie north of the Eastern Alps. The Bohemian Forest (Böhmerwald), Ore Mountains (Erz Gebirge), Sudetes, and Bohemian-Moravian Highlands surround and almost completely isolate Bohemia (Čechy), the basin in which the main headwaters of the Elbe gather. To the west of Bohemia, between the Bohemian Forest and the Eastern Alps of Tirol, is the Bavarian Basin, the headwater territory of the Danube. To the east of Bohemia is the arc of the Carpathians, resembling the Alps in many ways, but covering a larger area and having opposite orientation, the convexity pointing eastward.

The westernmost Carpathian ranges are low hills across the Danube from the easternmost Alpine ranges, near Vienna. The Little and White Carpathians lead to the Beskides, Low and High Tatra, and other mountains that swing around the northern and eastern sides of Alföld, the Plain of Hungary, and the plains and hills of Transylvania. Carpathian trends in central Rumania are almost north-south. Here they abut against the eastern end of Rumania's great east-west range, the Transylvanian Alps, which separates the plain of Wallachia from the Muresul (Maros) Valley of Transylvania. The Transylvanian Alps extend westward to the Iron Gate of the Danube. The Carpathians, Transylvanian Alps, and Balkan Mountains form a gigantic S reversed in orientation as if viewed in a mirror.

CULTURAL EFFECTS OF HIGHLANDS

Mountains and lofty highlands are typically negative areas culturally. They are ordinarily sparsely inhabited and separate more populous regions, which are likely to be culturally diverse. The people on one side of a highland barrier

commonly differ in race, language, religion, habits of dress, types of economy, and in other culture traits from those on the other side. The great east-west mountain barrier in Europe thus separates a distinctive culture realm, the Mediterranean, from the culture realms of Northwestern and Eastern Europe.

The European mountain barrier, with adjacent uplands, is so broad and contains so many attractive valleys and basins that its negative cultural influence should not be overemphasized. Only the very highest and most rugged regions are uninhabited. Culture diffusion has occurred across passes, along valleys, and through such gaps as the Rhone Corridor and the Bosphorus.

Some moderately rugged areas have served as refuge sites, where traces of interesting old cultures have been preserved. The Basques, for example, found haven in the western end of the Pyrenees, where they have maintained their own language, an extremely ancient tongue, and many other distinctive traits. Small groups of peoples along the southern slopes of the Alps cling to such unfamiliar languages as Rhaeto-Romanic, Friulian, and Ladinic. Many customs and styles of dress differ from valley to valley, striking examples being typical of Tirol. Isolated groups have managed to retain total or partial political independence, the Swiss on a large scale; those of Andorra (Pyrenees) and Liechtenstein, less conspicuously.

The east-west mountain barrier is significant as being the predominant western and central European habitat of a distinct racial stock, the Alpines. While Alpine peoples are by no means confined to mountains and any general classification of Europeans according to physical characteristics must recognize the presence of these sturdy, broad-headed peoples in every part of the continent, it is nonetheless true that they are particularly numerous along the highlands between more Nordic populations of the plains to the north and the more Mediterranean of the peninsulas to the south.

The larger and more attractive plains and basins within the mountain barrier have been hotly contested prizes long sought after by peoples from all sides. Invaders have appeared on the scene time after time either to migrate onward to other lands or to remain and blend their stocks and cultures with those already there. Thus came the Romans to Wallachia at an early date, bringing a language that has changed less during 20 centuries in becoming Rumanian than has the language at home in becoming Italian. Germanic invaders either crossed or by-passed the Alps to occupy such places as the Po Valley. Some went past the Pyrenees to settle in Spain and lands beyond Gibraltar, in northern Africa. Occasional invaders

came from remote places, the Huns, Magyars, and Turks being examples of Asiatic peoples who in part retain their identities and culture traits in spite of long residence in Europe. Many invading groups became lost, or absorbed, among the peoples already present in the basins of central Europe.

Toward the eastern end of the mountain barrier, especially in territory lying between Vienna and the Black Sea, cultures have clashed, shattered, and mixed to a degree hardly equalled elsewhere. Here are most confused patterns of distribution of such traits as language, religion, dress, house types, and ways of living. Many invaders reached this region by crossing the plains of southern Russia, where progress was easy and relatively rapid. Mountain barriers stopped them or converged travel routes through a comparatively small number of passes into basins already occupied by earlier arrivals.

EUROPEAN PLAIN

The great European Plain lies north of the east-west mountain barrier. It is one of the most productive areas on earth and extends broadly enough to give Europe the lowest average elevation of any continent.

Table 3 Average elevation above sea level (feet)

Asia	2,883	South America	1,702
Africa	2,007	Australia	1,118
North America	1,953	Europe	958

Much of the low territory in Australia is too arid to be very useful. In South America, much is too hot and wet. The lowlands of Europe and North America have greatest average utility from the agricultural standpoint and are capable of sustaining large populations. The European Plain supports one of the greatest population densities on earth. Only latitudes higher than Leningrad (circa 60° N.) and arid flats in the southeast toward the Caspian have densities as low as those in the Great Plains of the United States, west of central Oklahoma, Kansas, or Nebraska.

The European Plain starts on the French side of the Pyrenees and in western Ireland and extends eastward to the Urals. The width expands abruptly just east of the Carpathians, so that the plain spreads from Arctic Ocean to Black Sea. Though properly called a plain, this vast lowland is by no means flat. Many hills jut up to interrupt its continuity, especially toward the west. Some are stubs of old mountains that have been worn down by the

processes of degradation and erosion. Others are glacial deposits of rather recent origin.

The fact that the earth has recently experienced an Ice Age is extremely significant in connection with the geography of the European Plain. During the Ice Age, caps of ice, such as today exist only in Greenland and Antarctica, covered large parts of the northern continents. In Europe, ice covered all of Scandinavia, the British Isles as far south as London, and the European Plain from the Netherlands eastward across Germany to central Russia. Many mountains to the south had individual ice-caps of their own. The Alpine cap was particularly large (see figure, page 20).

Continental ice was thickest over Scandinavia, Finland, and northwestern Russia. Under its great weight many basins were scoured in solid rock, and most soils or other loose materials were carried away by slow movements of ice flowing toward seas or other ice margins. Many scoured basins are rock-floored lakes today. Debris removed from places where the ice was thickest eventually reached ice margins to be deposited as *moraines*. The position of the edge of the ice depended on whether ice supply was sufficient to overcome melting. All ice margins advanced when the main cap thickened and retreated when it thinned. Moraines are thus spread widely over the plain, many in the form of high ridges, marking places where the margin halted for a relatively long time, and others as irregular low ground over territory where ice retreat was faster. Mountains were generally sites of ice scour and adjacent lowlands became places where moraines were deposited.

It is estimated that some 95 per cent of the world's lakes are of glacial origin. They occur both as a result of scour and deposition. Many of the most picturesque occur in mountains, but by all odds the greater number are to be found in flatter areas of ice scour, such as in northern Minnesota, northern Wisconsin, and states to the east. In North America they occur in a broad belt concentric to Hudson Bay. The equivalent European region is concentric to the Gulf of Bothnia, being particularly pronounced in Finland. The belts of most pronounced moraines lie farther south. In North America moraines are most conspicuous between Iowa and New Jersey. In Europe they extend from western Ireland and across the plains on either side of the Baltic to central Russia.

Morainal ridges have long determined routes across the European Plain. They rise above lowlands where drainage may be blocked, so that extensive flats are subject to flooding. Early man

sought moraines for locating his trails. Today they serve to determine highway and railroad patterns for commercial or military use.

The principal moraines divert rivers seeking outlets beyond the plain. In Germany most of these diversions affect northward-flowing streams, offsetting them to the west. Streams with upper courses that seem destined to reach the east or central Baltic actually empty far to the west, even into the North Sea. The Elbe is typical. It rises in Bohemia and reaches the plain about south of Berlin. Followed downstream toward the North Sea, it exhibits many distinct segments, generally alternating between short courses northward across morainal ridges and longer courses westward in the valleys between moraines. Several of these intramorainal valleys serve more than one stream. Canals have been built at low cost along these lowlands connecting all the principal rivers of the German part of the plain. A barge in the navigable part of the Oder may reach the Rhine over a course that remains well inland from the Baltic. Morainal trends, in determining transportation routes, have had much to do with the cultural unification of the western part of the European Plain.

The last Ice Age involved more than one great accumulation and disappearance of continental ice. There were several *glacial stages* of ice accumulation which alternated with *interglacial stages*, when ice retreated to, or even beyond, the limits it has today. Sea level, the world over, dropped each time that large accumulations formed on the continents, because the water stored there as ice came from the world's oceans. During stages of maximum ice cover the volume of continental ice was enormous enough to lower the seas somewhat more than 400 feet below the levels they have now. Each interglacial stage was accompanied by a return of waters to the oceans and high sea level. It is interesting in this connection to observe that if all the water now incorporated in the icecaps of Greenland and Antarctica were returned to the oceans, sea level would rise an additional 150 feet, or more.

The European Plain extended farther west during glacial stages of the Ice Age. The British Isles were connected with the mainland and most of the floor of the North Sea was lowland plain. The locations of many rivers that once crossed this lowland have been traced by soundings and bottom sampling. It is definitely known, for example, that the Thames and Rhine were once tributaries of a river that flowed northward around the British Isles into the Atlantic. When that river functioned, our ancestors walked freely between France and England.

The melting of continental ice during waning glacial stages and the oncoming of conditions such as we experience today, drowned coasts on a world-wide scale. Old valleys that led to low, glacial-stage seas were partly submerged, so that their coastal ends became bays or estuaries, such as Chesapeake Bay, or the Thames Estuary below London. People who lived on coastal lowlands were driven upslope, not catastrophically, but so slowly that probably no one was ever aware of the migration. It took many thousands of years for the ice to melt. Even today we are not certain whether in the long range our coastal inhabitants are to be driven higher by the melting of Greenland and Antarctic icecaps, or centuries of ice accumulation will permit migrations to somewhat lower levels. Just at present there is a definite, but extremely slow, rise in sea level.

NORTH SEA CULTURE FOCUS

Drowning of the western end of the European Plain created most of the North Sea, the Baltic, and other arms of the sea. While many ancient

land routes were covered by water, the presence of these seas by no means ended the possibilities of communication between peoples on opposite shores. Man learned to use boats at a very early date. The men who built *megaliths*, or monuments of huge stones, as early as 3000 B.C., were seafarers. Primitive man found no great difficulty in sailing along coasts or across narrow seas. The ancients thus "coasted" far beyond the limits of the eastern Mediterranean to all shores of the Black Sea, along the shores of Asia to Ceylon, westward beyond the Pillars of Hercules (Gibraltar) to Britain, the Canaries, and around Africa. In northwestern Europe men were sailing freely along the shores of the North Sea and across the Baltic. The widespread use of boats had much to do with the unification of cultures around the shores of the Mediterranean, on one hand, and around the North Sea, on the other.

During Europe's Middle Ages, Norwegians, Danes, and other peoples crossed to Britain or followed coasts southward with various objectives,



European culture realms

such as plunder, harter, or colonization. Germanic Angles and Saxons crossed from the mainland in such great numbers that they became dominant population elements of Britain. For many centuries political units bridged the English Channel, North Sea, and Baltic.

The North Sea has many advantages. Several of Europe's most important rivers lead to it, and goods move readily along their channels. For untold centuries peoples have gravitated along flood plains toward North Sea coasts. Many were attracted by the excellent fishing in the sea itself. Norseman, Saxon, Piet, Celt, Frank, and other peoples had frequent contacts around the margins of the sea. Culture traits were exchanged. Similarities appeared in dress, what people ate, how they were sheltered, how they worshiped, in codes of morals, and in patterns of thought. Cultural characteristics were so blended that whatever the racial origin of any group might have been, all North Sea peoples came to resemble each other more closely than they resembled peoples of distant lands. The North Sea served as a *culture focus*, around the shores of which the distinctive culture of Northwestern Europe evolved.

SECONDARY BALTIC FOCUS

The focal attraction of the Baltic has always remained secondary in comparison with that of the North Sea. Its waters are comparatively fresh, so that they freeze more readily and remain ice-covered for longer periods than those of the more saline North Sea, or German Ocean, to the west. Navigation is impossible for several winter months in the eastern Baltic and is at least difficult for a month or more toward the Kattegat. Brackish water contains fewer fish. Commercial use of the Baltic is restricted by similarities of products along its various shores. Invitation or challenge to plunder, explore, harter, or settle was far less forceful across a sea with such similarities in coastal lands. Though Swedes and others have crossed the Baltic at various times for purposes of conquest or trade, contacts between peoples on opposite shores were generally less frequent than those around the North Sea. There was less blending of cultures. Culture traits remained more localized. The Baltic, generally, has remained a secondary influence in the cultural evolution of Northwestern Europe.

EASTERN EUROPE

The expanded plain in eastern Europe presents many physical contrasts with lands in the partially

submerged west. Maritime influences are distinctly marginal. Instead of rivers leading centripetally toward a common focus, the drainage of Russia is centrifugal. Rivers flow radially outward from the low Valdai Hills northwest of Moscow. The Don and Dnieper (Dnepr) systems lead southward to the nearly land-locked Black Sea. The small Niemen, Dvina (Daugava), and Lovat lead to the eastern Baltic, ice-locked in winter. The Onega, Northern Dvina, Mezen, Pechora, and other streams flow toward the cold Barents Sea of the Arctic. The greatest river of all, the Volga, leads down a blind alley to the Caspian, a sea long severed from the world ocean system in a climate so arid that its level now lies about eighty-five feet below that of the Black Sea and other bodies of water with oceanic connections.

To render their rivers useful for more than internal use, the Russians have long tried to gain control of coasts lying some distance beyond their own lands. Their most important coast, that along the Black Sea, is accessible only through narrow connections leading into the Mediterranean. The goal of mastery of this bottleneck has never been attained. Alien peoples have also flanked the Baltic. Ice is a seasonal foe to free movement both along the Baltic and Arctic coasts. The ice-free Murman Coast lies in territory so remote that it became useful only in recent decades. A common "urge to the sea" developed considerable unification among the Russians.

Overland communication was always difficult across the vast flats of the eastern part of the European Plain during the rainy season each summer when trails and roads were often muddy. The frozen ground and streams each winter were more useful, because the runners of sleds glided across them readily. Goods could be traded and contacts between peoples were stimulated by ease of winter communication and by the fact that people were less busy during the season of agricultural dormance. Sled transportation and long, cold winters served to unify culturally peoples of the eastern part of the plain, much as the use of boats had blended cultures around the North Sea. On the plains of Russia evolved a rather homogeneous culture quite unlike that of Northwestern Europe. This eastern region is a third great realm of the European World.

SUMMARY OF CULTURE REALMS

South of the great east-west mountain barrier on the rugged peninsulas of the Mediterranean, people developed cultural unification which in many regards became ancestral to that that we know today in the European World. The surviving

form of this culture constitutes one of the realms of the European World, the Mediterranean. The great European Plain north of the barrier presents contrasting physical conditions around its partially submerged western part and over its broad eastern territory. Around the focus of the North Sea, and secondarily along the Baltic, developed the Northwestern European culture realm and on the extensive flats to the east the culture realm of Eastern Europe. Between these three realms are transitional zones of clashing cultures.

MARGINAL HIGHLANDS

Three main areas of highland territory have been neglected in the discussion above, for the reason that they have had little to do with the shaping of European culture distribution. Northwestern Highlands extend down the Scandinavian Peninsula and, with interruptions, across to Scotland and Ireland. The Urals, between the great plains of Europe and Siberia, trend almost north-south. The mighty Caucasus Range, along Europe's southeastern border, is part of the east-west Eurasian mountain barrier.

The Northwestern Highlands have exhibited negative cultural significance. Their environments are in many ways hostile to development of European culture traits, which favored their use as areas of refuge for peoples who resisted European ways of life. Polar World Lapps still range far to the south along the higher parts of Norway. The

last strongholds of various Celtic and other tribes were in the highland parts of Scotland and Ireland.

Though the Urals rise to over 5,000 feet at places and are continuous for more than 1,000 miles, their slopes are rather gentle and many low passes cross their summits. They have never acted as an important barrier to peoples or to spread of cultures. Peoples have crossed them at will for thousands of years, mainly in a westward direction. European culture, more recently, has traveled eastward with little interruption across their summits and over Siberia.

The highest peaks and deepest valleys in Europe are in the Caucasus. Elbrus attains an elevation of 18,465 feet and ten or more peaks rise above 15,000. Passes are few and difficult. Peoples deep in valleys have long remained isolated from those a few miles away. Such conditions favor sharp cultural contrasts. Few areas of similar size present such a hodgepodge of languages, dress, habitation types, and other culture traits. Diversification is also favored by location in the transitional zone between European and Dry Worlds. Some of the flatter and better-watered parts of Georgia and Soviet Armenia south of the Caucasus are well suited to European ways of life, and their inhabitants have adopted them to considerable degrees. Nearby are territories suited only to the purposes of Dry World nomads, so that Europeanization has hardly been felt.

5: Climates and Vegetation

All of Europe lies north of the latitude of Memphis, Tennessee. Point Marroqui, southernmost mainland tip of Spain and Europe, lies in latitude $36^{\circ} 2'$ N. Other places approximating this latitude are: Hoover Dam (Nevada and Arizona), Tulsa (Oklahoma), Durham (North Carolina), Tunis (northern Africa), Tehran (Iran), Lanchow (northern China), and Tokyo (Japan).

Northernmost Europe has about the same latitude as northernmost Alaska. Cape Nordkyn, farthest north on mainland Europe, lies $71^{\circ} 0'$ N. More famous is North Cape on an island in latitude $71^{\circ} 10'$. Point Barrow, Alaska, is in $71^{\circ} 20'$. That these differences are rather inconsequential may be appreciated from the fact that a degree of latitude is not quite seventy miles in length and a minute is about one and one-sixth statute miles, or one nautical mile.

Europe experiences comparatively mild temperatures in spite of its high latitude. It has adequate precipitation almost everywhere. It is favored above other continents in comparative absence of uninhabitable deserts, broad Arctic wastes, extensive plateaus with altitude sufficient to prevent normal human activities, and it is entirely free from tropical heat. There are few parts with too much rain for efficient agriculture.

The climates of Europe resemble those of western parts of other continents in similar latitudes. Coastal Norway is climatically similar to coastal Alaska and southern Chile. Climates to the south, through France to the Iberian Peninsula, are similar to those from British Columbia to about the latitude of Los Angeles, or northward along coastal Chile to Coquimbo. Northeastern European Russia resembles northwestern Canada along the Mackenzie River. The Southern Hemisphere offers no counterpart because South America tapers too narrowly southward to develop a continental climate. Southeasternmost Europe is the climatic equivalent of the more arid parts of Utah and northern Arizona, or parts of Patagonia.

The relative positions occupied by areas of similar climate are the same in Europe as in North America, but individual shapes of those

areas differ according to contrasts in mountain trends and the distribution of lowlands. The north-south continuity of western mountains crowds climatic regions in North America. The climate characteristic of the coast of Oregon spreads broadly eastward in Europe, because an uninterrupted lowland extends far inland.

The greater warmth of the North Atlantic, as compared with the North Pacific, tends to render European climates somewhat milder in a given latitude than their American equivalents. This oceanic warmth depends mainly on the configuration of the north coast of South America and the ability of currents to flow freely into the Arctic Ocean. Water driven westward by rather steady trade winds forms a warm current near the equator. As this current approaches South America the trend of the north coast deflects most of the flow northward into the North Atlantic, where it is called the Gulf Stream. The westward equatorial currents of the Pacific are more equably divided in the western part of the basin, one flowing north to become the Japanese current (Kuroshio) and the other south to become the East Australian current. More equatorial warmth is carried to the North Atlantic than to the North Pacific, and it is concentrated in a smaller ocean.

METEOROLOGICAL PROCESSES

Air that stays some time over the North Atlantic becomes warm and moist for its latitude. When it moves as wind the warmth and moisture are carried along. The moisture is invisible in the form of a gas, water vapor.

When air is forced upward it expands, because there is less confining weight of other air above it. Expansion is a direct cause of cooling. This action may be noted when air is released through a tire valve. A casing may be too hot to touch with comfort and the air within has about the same temperature, but if it experiences a pressure reduction, such as from 30 pounds per square inch within a tire to ordinary atmospheric pressure beyond the valve, it expands and cools. The opposite action may be observed when a tire pump

is used. Each compression stroke increases pressure and heats the air within the barrel, so that after a few strokes the pump feels hot.

Free air is forced upward over warm places, just as it rises above a bonfire. The greatest general updrafts in the atmosphere occur over equatorial regions. Pressure reduction in these updrafts expands air, so that it cools in enormous quantities, rendering condensation and cloudiness general. For condensation to occur, however, it is necessary that air contain sufficient water vapor. Much air that rises over hot deserts is too dry to form clouds. Air that is forced up topographic slopes, or up inclined surfaces of masses of cold and heavy, ground-hugging air, also tends to form clouds.

Air is seldom perfectly motionless, or calm. It ordinarily moves with varying speeds because it is subjected to *pressure gradients* that force it from places where pressure is high, or heavy, toward places where pressure is low, or light. Moving air, *wind*, may travel long distances across flat surfaces, such as oceans or extensive plains, always in the direction of lower atmospheric pressure. Pressure gradients may force it up the slopes of mountains, in which case it cools, or downslope, with resultant heating. Cooling favors condensation. Heating favors evaporation, not only along the earth's surface but also of any clouds within the air itself.

Let us suppose that during summer a large part of the eastern European Plain has been sufficiently heated to cause a drop in pressure far lower than that existing over the North Atlantic Ocean. In obedience to the direction of pressure gradient, air from the ocean starts moving toward Russia. Some of it reaches the coast of Norway, where there is an abrupt topographic ascent of several thousand feet. If the pressure gradient is strong enough to force air up the ascent, cloudiness will likely occur along the coastal highlands. If the clouds are sufficiently dense and thick, many cloud particles will unite, becoming rain drops if the temperature is above freezing, or snowflakes if below. Rain drops will fall earthward rapidly or snowflakes will settle more slowly if some form of precipitation is to reach the ground below the clouds.

On the topographic descent across Sweden, air will be heated, clouds will evaporate, and skies will clear. As the wind progresses eastward across lower and flatter country, it is likely to remain clear and dry. Radiation of heat from warm ground below will emphasize these characteristics. Somewhere, however, the air may encounter territory where the pressure is low enough to attract winds from various sides, where some of it is

forced up to produce general cloudiness. Here precipitation may occur. In this illustrative example, the two main causes of precipitation have been noted; one where air was forced upward in ascending topographic heights, and the other over flat territory where the ascent resembled that taking place over a fire.

AIR-MASSSES

To understand upward movements of air over air, it is necessary to think in terms of air-masses. An *air-mass* is nothing more than a large volume of air having fairly uniform temperature, moisture, and weight characteristics that differ from those of surrounding volumes of air. It has already been noted that the air-mass over the North Atlantic is likely to be warm and moist for its latitude. It attains those characteristics because it overlies a large surface of relatively warm water. Air overlying continental interiors, on the other hand, tends to be dry. It has been subjected to various moisture losses and has little opportunity of evaporating enough moisture to compensate the losses. If the continental area is cold the air also becomes cold, and therefore heavy. Air over hot areas tends to become hot and light. The characteristics of an air-mass depend mainly on the nature of the earth's surface below it. Air over interior Asia becomes extremely dry, cold, and heavy in winter and dry, warm, and light in summer.

The main air-masses may be classified as polar (cold and heavy) or tropical (warm and light); marine or oceanic (wet) and continental (dry). The temperatures and weights of oceanic air-masses are rather uniform because large water surfaces are not subject to great changes in temperature between summer and winter. Continental air-masses are subject to greater extremes in temperature and weight seasonally. A high-latitude continental air-mass is thus likely to be cold and heavy in winter, but light and warm in summer. It is dry in either case.

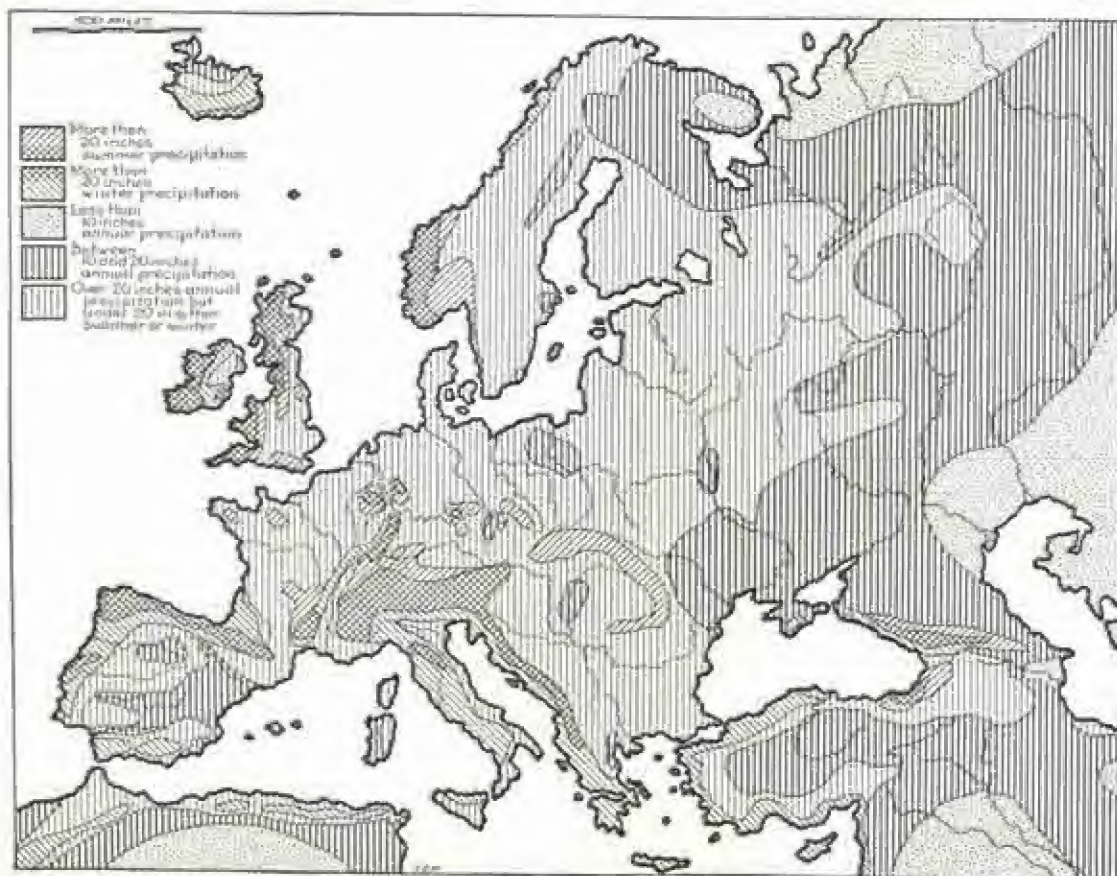
The air of one air-mass does not mix readily with that of another. If the contrast be that of temperature, the colder and heavier air tends to cling to the ground, so that warmer and lighter air overrides it when the two come into contact. Boundary surfaces between air-masses are called *fronts*. Fronts between air-masses that differ notably are ordinarily sharp and well defined. Those between quite similar air-masses are indistinct. Fronts ordinarily move across the earth's surface and through the atmosphere above. In extreme cases they may advance at such rates as 40 or

more miles per hour. Abrupt changes in weather take place along sharply defined fronts.

The polar continental air-mass of North America builds up over central Canada with cold, heavy, dry air as characteristic, these qualities being accentuated in winter. Pressures become high and winds blow outward in various directions. In extreme contrast is the tropical maritime air-mass of the Gulf and Caribbean with warm, light, and wet air. The front between these air-masses commonly lies somewhere in the central lowlands between Canada and the Gulf of Mexico, being pushed southward when pressures are particularly high in Canada and retiring northward when pressures drop in that region. The contrast is ordinarily sharp along the frontal zone of the polar air, which being heavy clings to the ground as it advances. The advancing front is wedgelike in vertical cross section, the polar air thinning southward. Wherever this polar air invades territory formerly occupied by warm, maritime air, the latter is forced upward, so that condensation,

cloudiness, and precipitation are likely to result. At some particular place, such as Dallas, ground temperature and air temperature may be quite high, and air dampness may be felt as general sultriness or mugginess while tropical maritime air is present. When an invasion of polar continental air occurs the weather changes. Along the frontal zone there may be precipitation and high wind. After the polar air has become thoroughly established and the front may have moved to the vicinity of New Orleans, skies will clear at Dallas, where the air is dry and cool. This is the common rhythm of weather in the temperate zones. The remaining part of the cycle is one in which a loss of polar continental characteristics occurs, permitting invasion by tropical maritime air a few days later.

The weather and climates of Europe depend on similar conditions. The polar continental air is of Siberian origin. Winds leave it with particularly great force and regularity during the cold season. Marine air from the North Atlantic is under-run by heavy Siberian air on many occasions during the year, producing cloudiness and precipitation. North Atlantic air is not so hot and wet as tropical



European precipitation

maritime air over the Gulf and Caribbean, and fronts are ordinarily less well defined in Europe than in the central United States. The intensity of European storms is therefore likely to be less. Tornadoes are almost unknown in Europe. In summer, when Siberian air is warmer and lighter, continental pressures are lowered and marine air is likely to be more widespread over Europe.

There are seasonal variations in the location of the frontal zones of storminess and precipitation. In winter they lie farther south as a rule and summer sees them retreat to high latitudes. For this reason most of the rain in southern Europe falls in winter. The Mediterranean, in particular, lies south of the territory that experiences the passages of pronounced frontal zones in summer. To the north of the east-west mountain barrier most of the rain falls in summer because there is more oceanic air over the continent at that season with abundant moisture to be condensed and precipitated whenever fronts pass, or other disturbances force air upward.

Southeasternmost Europe has difficulty getting any precipitation whatever. In winter it ordinarily lies well within Polar Siberian air and is dry for that reason. In summer it lies south of the zone where fronts are most common, and like the Mediterranean, it remains dry. At any season its great distance from the sea permits so much modification of oceanic air that most North Atlantic characteristics are lost before arrival in southeastern Europe.

PRECIPITATION

The meteorological and air-mass discussion just concluded furnishes a basis for understanding a summary of precipitation characteristics of Europe. The total amount each year is generally greatest in western Europe and least in southeastern because the Atlantic Ocean is the source of practically all the moisture that reaches the continent. Precipitation is excessive in certain western highlands, amounting to over 60 inches per year in the western and higher parts of the British Isles, the western slopes of Scandinavia, the western Pyrenees, and along some windward slopes of the Alps. The proportion falling in winter months increases somewhat toward the south, but in all of these excessively wet places some rain is to be expected during each month of the year. In extreme contrast are the arid lowlands near the Caspian and the region of very little precipitation along the Arctic coast east of Norway.

Mediterranean Europe is a land of winter rainfall, this condition being most pronounced in lowlands. Northwestern Europe receives rain at

all seasons with some snow in winter. Eastern Europe is mainly a land of summer rains, remaining dry and having relatively little winter snow because it is blanketed so much of the time by dry, cold air. Highlands everywhere have more rain and snow than nearby lowlands. The Caucasus Mountains are adequately supplied because they rise high enough to force considerable condensation, even in the relatively dry air of southeastern Europe.

TEMPERATURES

The earth's main temperature controls operate in such a way that polar regions tend to be cold, tropical regions warm, oceanic areas moderate, and continental territory in medium and high latitudes extremely variable with cold winters and hot summers. Various combinations of these tendencies occur and are complicated by local differences in relief. Mountains tend to be colder than lowlands in the same latitude.

The western coast of Europe has notably mild temperatures because it so commonly lies under North Atlantic air. During July the average temperature at North Cape is about 50° F. (10° C.). Higher temperatures occur southward, those in southwestern Portugal being slightly above 70° F. (21° C.). Winter temperatures are also mild. In January it is necessary to go about as far north as the Lofoten Islands, about 68° N., to find an average temperature as low as that of New York City, which is in latitude 40° 40' N. In extreme contrast to these oceanic, or maritime, temperature characteristics are conditions experienced in eastern Europe, where summers are really hot and winters bitterly cold.

The temperatures of European lowlands in summer are arranged in belts that trend about easterly. To reach a lower temperature one normally travels north. Highlands interrupt the regularity of the pattern; lower temperatures may also be reached by ascending them. The winter temperature pattern is quite different. The belts trend north-south. Warmer temperatures lie to the west and the coldest are found to the east.

The January isotherm of 32° F. (0° C.) is one of the most critical geographical boundaries on earth. In North America a temperature equal to the freezing point of water for the average of all hours of all January days occurs along a line that extends from the Atlantic Coast just south of New York City, through Louisville (Kentucky), St. Louis (Missouri), Trinidad (Colorado), along highlands not far above Portland (Oregon), grad-

ually dropping in elevation to sea level on the Pacific Coast not far south of Sitka (Alaska). This same isotherm crosses the Atlantic Ocean through southernmost Iceland to the Norwegian coast near the Lofoten Islands. A narrow strip of coastal lands lies on the warm side of the line in Norway. Western Denmark is also slightly above the average temperature of 32° F. in January. The isotherm continues southward into western Germany and swings around the Alps in southeastern France. The trend is generally eastward from France to the Caucasus, but it is complicated in detail. It keeps highlands such as those north of the Adriatic and the Balkan Mountains on its cold side. It skirts the shores of the Black Sea; southernmost Crimea, a narrow belt of coast below the Caucasus, and strips along the coasts of the Anatolian Peninsula of Asia Minor are on its warm side. From the northern coast of Syria it crosses to the northern side of Mesopotamia and continues eastward south of the Himalayas.

Winters are considered mild if the coldest month has a temperature averaging above 32° F. The British Isles, westernmost Germany, the Low Countries, western France, Mediterranean lowlands, and a very narrow strip of southern Russia are lands falling into this category. Snow is an uncommon form of precipitation. When it falls it is of the "wet" variety that comes in large flakes and clings in picturesque manner to everything it strikes. Problems of keeping men and livestock warm in winter are relatively simple. Houses need comparatively little insulation. Fuel supply is a matter of moderate concern at most. Streams flow throughout the year and harbors remain open in winter. Where summers are warm enough, citrus crops, grapes, and olives may be grown, as well as many other plants that are unable to survive severe freezes. Quite different are winters in other parts of Europe, where severity increases with distance from the January 32° F. isotherm. In the northeastern part of the continent the average January temperature is below 0° F. (-17.8° C.).

The isotherm of 50° F. (10° C.) for the warmest month is another significant line. In general it marks the cold timber line and hence the poleward limit of forest growth and southern border of tundra climates. The western and northern coasts of Alaska and parts of Canada north of about the middle of Hudson Bay lie north of this line, as does the coast north of Newfoundland. The tundra region of Europe extends from the highlands of Scandinavia as a belt along the Arctic coast which includes the northern half of the White Sea. Here dwell the inhabitants of the Polar World.

ARIDITY

The desert climate of southeastern Europe is hostile to development of European culture. Where the precipitation is not only insufficient to support field crops but incapable of maintaining enough grass to permit pasturage of animals under conditions where owners and herders may maintain permanent residences, Europeans are generally unwilling to settle. Nomads with an entirely different culture occupy such regions. A small part of Europe thus falls within the Dry World. This area includes lowlands on the northern and western sides of the Caspian Sea.

Steppes are regions of intermediate aridity. Their vegetation consists mostly of short grass, and their soils are ordinarily fertile. Domesticated cereal crops flourish in their more humid parts, and grazing is ordinarily good until the borders of the desert are reached on their more arid sides. Europeans were long quite reluctant to invade steppe territory, but most prejudices against these regions have been broken down during the last century or so. The steppes of Europe are today almost completely Europeanized.

The most extensive and most highly productive steppe territory is a broad belt across southern Russia, where annual precipitation normally amounts to between 10 and 16 inches. The Hungarian Alföld and large parts of the Spanish Meseta approximate steppe climate.

Some of the highland territory north of the Adriatic is functionally arid in spite of annual precipitation sufficient to maintain forest and humid-climate crops elsewhere. This *edaphic aridity* has resulted to some extent from deforestation, but it is mainly a matter of the distribution of certain types of limestone bedrock. These limestones fracture easily and dissolve rapidly. Cracks widen by solution. Water flows across the surface until it comes to a crack, down which it plunges to become part of some subterranean flow. Many caverns and underground passageways, some large enough for rivers, lead subterranean waters back to the sea. Meanwhile the surface, deprived of normal water supply, supports crops and kinds of vegetation that are characteristic of steppes, or even deserts, elsewhere.

CLIMATES

Temperature and precipitation characteristics are combined for the purpose of defining climatic types, or climates. Summarizing the materials in this chapter, we see that Europe may be divided into the following distinctive climates:

1. *Tundra climate*, characterized by an aver-

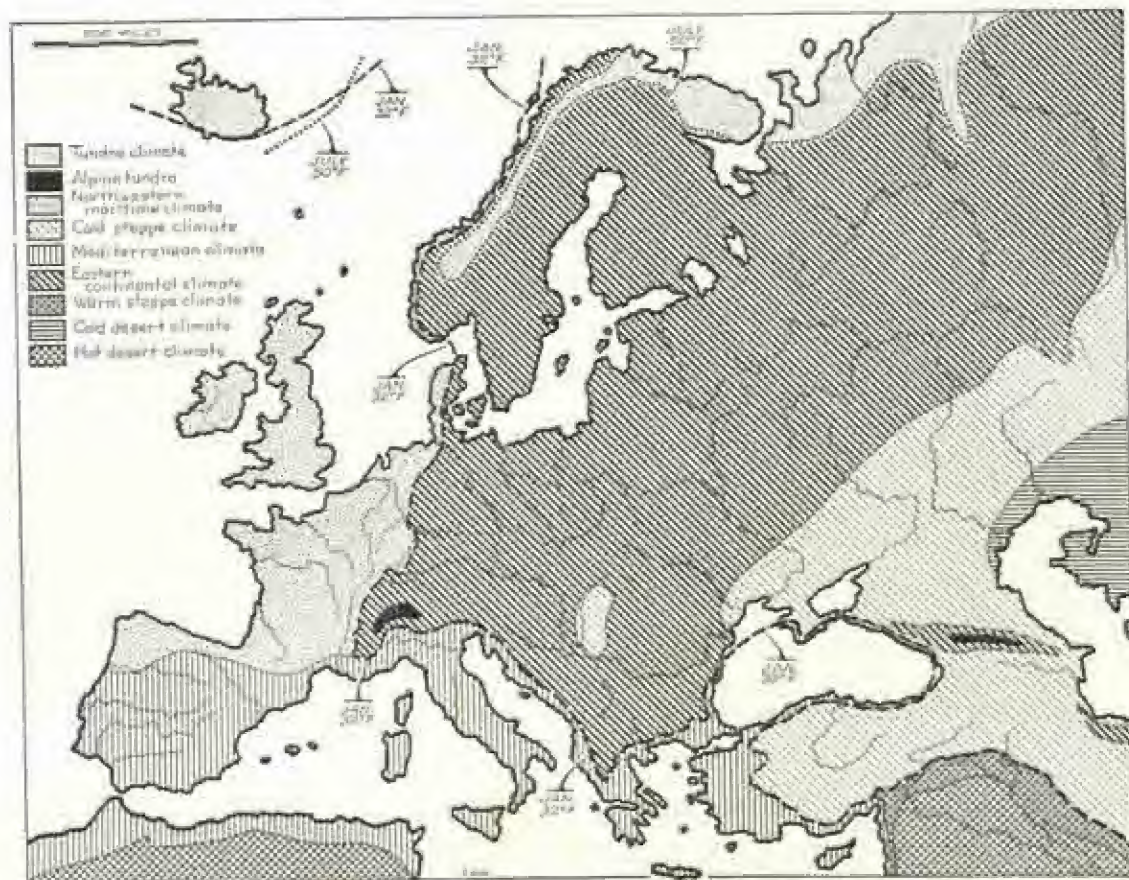
age of less than 50° F. for the warmest month of the year, occurs along the Arctic coast. Precipitation characteristics are of minor importance. The salient fact about the tundra is summer coolness, temperatures being too low for tree growth and for field agriculture. The characteristic vegetation consists of low shrubs, such as blueberries, quickgrowing summer annuals and grass, moss, lichens, and other lowly forms of plants. Dark gray colors predominate in the landscape, occasionally enlivened by the white of snow or the green of summertime grass in some particularly favored area.

Alpine tundra appears above certain critical elevations varying from near sea level in the Arctic to such heights as 8,000 to 12,000 feet in middle latitudes. The main contrast between alpine and subpolar tundra is with regard to length of day at various seasons of the year, an effect of latitude. Midwinter does not bring continuous darkness for several days, weeks, or months to such alpine tundra localities as the higher parts of the Alps or Caucasus. There is less forcing

of plant growth by long days of continuous sunshine in midsummer.

2. *Northwestern maritime climate*, with adequate precipitation at all seasons—all monthly temperatures in excess of 32° F. and that of the warmest month in excess of 50° F.—is typical of a narrow coastal belt of Norway, western Denmark, the British Isles (excepting some summit areas of tundra climate), and most of France. Extensive areas were originally covered with forest. Plants are abundant, agriculture prospers, and landscapes are green at most seasons.

3. *Eastern continental climate*, with precipitation concentrated during the warmer season—coldest month temperatures below 32° F. and warmest month above 50° F.—is most typical of central European Russia, but exists in milder form west to Norway and Germany and southwest to the Alps. Winters become extremely cold eastward, so that green disappears from landscapes which appear gray and drab. Spring may



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be so reduced in length that it can hardly be called a season. The same is true of the fall. In the hot summers, plants grow vigorously and landscapes are green.

4. *Mediterranean climate*, characterized by temperatures quite similar to those of the northwestern maritime climate, but with hotter summers as a rule, and precipitation concentrated in winter, occurs mainly around the Mediterranean Sea, particularly in lowlands. Landscapes turn green in the late winter and spring. By summer and during the rest of the year the effect of drought turns vegetation yellowish brown. Some of the many vegetational peculiarities of this climate will be discussed later.

5. *Steppe climate*, transitional between humid and desert regions, with somewhat deficient precipitation, occurs at various places. The actual amount of rainfall is variable depending on season and temperature. Rainfall that comes in winter evaporates less rapidly and less of it is needed for a given beneficial effect on vegetation than that falling in summer. Less rainfall is needed in cold places than in warm. In general the typical rainfall in steppes in the United States is between about ten and twenty-three inches per year, but it is less toward the Mediterranean climate of California and toward the Canadian border. Typical European values are slightly lower because of higher latitude. Two types of steppe climate occur in Europe.

Cold steppe, with temperatures below 32° F. during the coldest month, is developed across the plains of southern Russia and closely approached in the Alföld of Hungary.

Warm steppe, with coldest month temperatures above 32° F., occurs in parts of the interior of Spain and is closely approximated in the lowlands of Greece.

6. *Desert climate*, with extreme aridity, less than enough to maintain the short grass of driest steppe regions, occurs only in lowlands toward the Caspian. It is cold desert with January well below 32° F. Only highly specialized plants grow in the desert, most of them low shrubs widely spaced, except at oases, or places with local water supply. The oases may stand out as bright green spots, but the characteristic color of the desert landscape is gray.

CULTURE AND CLIMATE

Of the six main climates of Europe, only two, tundra and desert, are lands where environments are so hostile to European ways of life that Euro-

peans commonly shun them. Field agriculture is not possible in either case. Europeans are unwilling to adopt culture traits that must be assumed to make a successful living in such regions. There are exceptions of course. A rich mineral deposit, trade possibilities, need for scientific investigation, or opportunities of spreading a religious gospel force Europeans into territory of any kind, but rarely as permanent inhabitants and even less commonly to become absorbed into the ways of the Polar, Dry, or other culture worlds.

Three of the main climates may be identified roughly with the three culture realms of the European World. Northwestern Europe is quite largely the region of Northwestern maritime climate. Mediterranean Europe is intimately related to the area of Mediterranean climate. Eastern Europe centers in the territory of Eastern continental climate.

Transitions between climates are more or less paralleled by culture transitions. That between Northwestern maritime and Eastern continental climates is broad because it occurs across a flat territory. Germany is transitional in culture in many ways. The transitions northward from Mediterranean to other climates are typically abrupt because they take place up the slopes of mountains. The cultural transitions are also sharply defined.

DISTRIBUTION OF VEGETATION

Vegetation follows climatic distribution closely. *Tundra* is an ecologic term, signifying the assemblage of plants found beyond the cold tree line. The climatologist has adopted it for indicating the area where climatic conditions are so severe that plant life is thus restricted in variety. *Desert* literally means deserted—uninhabitable because of insufficient water supply. The ecologist has extended the meaning of the word to signify the assemblage of plants present in extremely arid regions, and the climatologist has adopted it to denote the area where these severe conditions prevail. Ecologists and climatologists seek the same boundaries for the limits of tundra and desert regions, but they employ entirely different methods. The biologic approach of the ecologist is one that uses the criterion of plant and animal distribution, whereas the physical approach of the climatologist involves the use of observational data derived from weather observations. Such an idea as bounding the tundra by the cold tree line is essentially botanical or ecological. Bounding it by the isotherm of 50° F. for the warmest month is climatologic.

Territory between tundra and arid (desert and

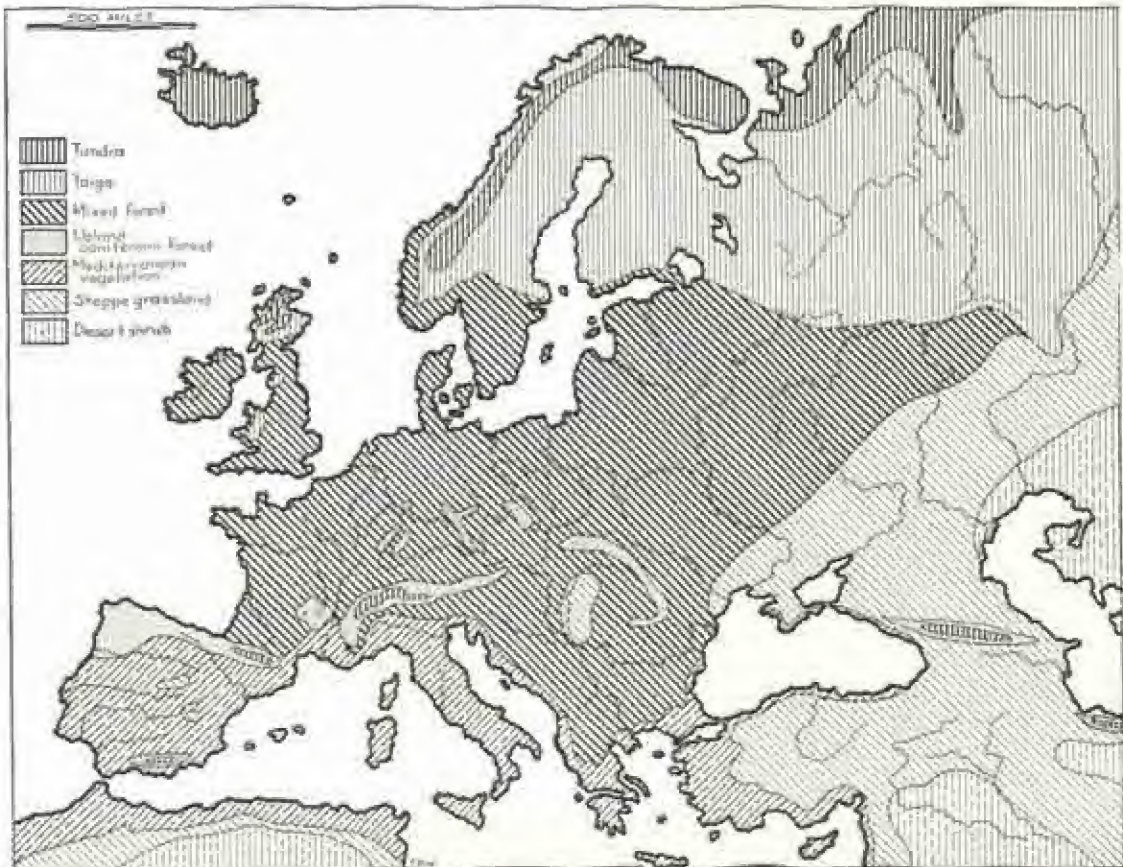
steppe) climates is generally capable of supporting forest, at least under favorable *edaphic* (pertaining to soil, exposure, and other factors related to the ground) rather than to the atmospheric conditions. While most European forests grow on slopes today, this is largely a feature of the *cultural landscape* (natural landscape as modified by man). Before man began to revolutionize European landscapes, forests covered extensive lowland territories as well. Most maps showing distribution of forest types attempt to restore primitive conditions. They leave out the vast areas of clearings, where men raise domestic crops, build cities, airports, or put the land to nonforest uses. The surviving forests of Europe are mainly of three kinds: (1) taiga, (2) deciduous, and (3) dwarfed.

The *taiga* is the dominant northern forest. Its trees are mainly conifers, such as spruce, fir, larch, and pine, all of which have "needlelike," narrow leaves. Among these, particularly along streams, around lakes, and in other wet places, are deciduous (shedding leaves during the cold season), broad-leaved trees, such as birch, alder, and

willow. The stands of conifers are commonly widespread, monotonous to the eye, and in many places dense. They are of considerable commercial importance because trees that grow slowly under cold climatic conditions provide strong, durable lumber. Toward tundra borders, all trees are stunted and therefore have less value.

The Eurasian taiga belt extends from the coast of Norway to the Pacific. Its northern boundary everywhere approximates the July isotherm of 50° F. Its southern boundary is conditioned by many factors, such as temperature, precipitation, and soil conditions. The European taiga runs south to a boundary passing through Trondheim and Oslo in Norway, past Stockholm, Leningrad and eastward about along the parallel of 60° N.

As a whole the taiga is hostile to settlement either by Europeans or peoples of the Polar World. It has long served as a wide cultural barrier. The northern limit of cereal crops lies rather centrally within it, and Europeans have slowly cleared the forest in extending their fields north-



Vegetation of Europe

ward to that limit. Norwegians, Swedes, and Finns have been doing this for centuries. The Russians are most active today in extending their fields to the "grain line." Even the Siberian taiga is slowly being added to the European World.

Forests similar to the taiga occur below the cold tree lines of mountains and other uplands farther south. The zone rises to higher elevations toward the equator, as do all other vegetational belts. Trees grow more rapidly and to larger size in these more southerly coniferous forests.

Deciduous forest was typical of most of the lowland of the European plain, but only residual patches remain today, most of which is "second growth," having originated after the virgin forest was cleared away. Dense stands of broad-leaved trees gave way to pines and other evergreens on many slopes and where soils were well drained. Thick forest originally covered much of the British Isles, the lowlands of France, and the plains extending eastward into Russia. Oaks, elm, ash, linden, and maple were typical deciduous trees of this forest. The original forests of the interior lowlands of the United States were similar but much richer in variety of species.

The transition between taiga and deciduous forest is broad at many places, especially across flat territory. It is generally true that vegetational and climatic boundaries are sharply defined only on slopes, where a few hundred or a thousand feet of ascent may be sufficient to condition considerable changes. Across plains a transition may take place only through scores, or even hundreds, of miles. Boundaries on maps are attempts to define central parts of such transition zones. The "mixed forest" of the Eastern United States or of the Soviet Union is transitional between taiga and deciduous forest. Conifers generally grow on the uplands and deciduous trees on the flats below, but there are many exceptions to this rule.

The transition to the south of the deciduous forest in Europe is ordinarily narrow because it occurs along slopes of the east-west mountain barrier and the various uplands to its north.

In the Mediterranean region, forests grow only under most favorable conditions. Strips of forest follow the moist lowlands near streams. Considerable contrast exists between north and south slopes of hills and mountains, south slopes being more barren because they lie more nearly perpendicular to the sun's rays and hence parch to greater degrees during the long, hot-season drought. In Mediterranean forests evergreen oaks, pines, wild olive, cypress, and laurel are likely to be present, with willow, elm, poplar, and sycamore along

streams. Chestnut appears at higher elevations and may form useful forest. Still higher are the trees of northern European lowlands and the alpine equivalents of taiga and tundra.

A distinctive "dwarf forest" is characteristic of lesser elevations in the Mediterranean realm. It bears such names as *maquis*, *makia*, or *mucchia*, and in Mediterranean-climate California, *chaparral*. Dense stands of thick shrub, rarely over six feet in height, hug north slopes of hills and spread over other places that are incapable of supporting larger trees or not quite dry enough to form grassy barrens. The shrub consists of such plants as laurel, arbutus, heath, rockroses, and broom.

Mediterranean-climate vegetation experiences the combination of extreme drought and hot weather each summer. Hills green in the wetter, cool season turn yellowish brown in late spring, so that the summer visitor from other lands feels that everything appears "burned up." To withstand such rigorous conditions many plants have assumed peculiar adaptations. They appear strange to visitors from other climates. Leaves are likely to be small, grayish or silvery in color, leathery, oily, or hairy. All of these adaptations cut moisture loss during the hot season. Many plants cast dense shadows, and trees assume a squat structure, spreading widely at low height, shielding underlying soil from sunlight and rapid evaporation. Many seeds are protected by thick layers of flesh, which may be oily, as in the case of the olive. Many flowering plants reproduce by division of bulbs rather than by germination of seeds. Bulbs lie in the ground, dormant through the dry summer. Size reduction, stunting, cuts moisture loss because total plant surface is smaller. Stunted plants are rather typical of all hostile environments, being present not only in the summer-parched Mediterranean, but in the desert and tundra as well.

In the transition between forest of any type and arid regions, one of the first indications is the appearance of scattered "prairies," or grasslands of limited size, surrounded by forest. The proportion of grass increases toward the steppe, where it is the dominant vegetational cover. Strips of *gallery forest* composed mainly of such trees as poplars, willows, and cottonwoods extend far into the grasslands along the moist soils flanking streams. *Park landscapes*, with scattering trees rising above continuous grasslands, lie on the more arid sides of the main prairie region. Moisture supply must be at least fairly adequate over most of the surface to support these parks. Under drier conditions trees grow only in clusters at locally favorable sites, such as around springs or above places where the ground water is close to the sur-

face. These patches of isolated forest are called *orchards* or *mottes*. Beyond orchard landscapes are the true grasslands of the steppe, which is commonly and incorrectly called prairie in the United States.

Park landscapes and grasslands with few trees occur in many Mediterranean lowlands of Spain, southernmost France, Italy, and Greece. They

also occur in the transition southward from the deciduous forest of the Soviet Union to the steppes north of the Black Sea. Long arms of gallery forest extend down the Russian rivers. Orchards gradually disappear toward the low-shrub deserts flanking the Caspian.

6: Racial, Linguistic, Religious, and National Groups

Animal species are normally divisible into various varieties or races. The species *Canis familiaris*, for example, includes every kind of dog from the St. Bernard to the Mexican hairless and the short-legged dachshund. *Felis domestica* includes every cat from the common alley variety to the aristocratic Persian or Siamese. *Homo sapiens* includes every type of living man.

For many years it was customary to believe that man could be divided into a few distinct groups called *races*. In the earlier classifications such terms as white, yellow, black, and red were used to name the main types. As the science of physical anthropology progressed it became customary to classify man according to criteria that could be expressed in units of measure, such as body height, ratio between head width and length, or composition of blood. It was found that relatively large groups of individuals have similar physical characteristics which have been determined by inheritance. There emerged from such studies the fact that in general *Homo sapiens* is quite readily divisible into three main *racial groups*: Negroid, Caucasoid, and Mongoloid. Each of these groups includes several races. Individuals commonly depart widely in physical characteristics from most members of their race. The real meaning of racial group, or of race, lies only in averages covering many individuals.

Populations that have long remained geographically isolated from other peoples generally become more homogeneous than those having more frequent contacts. Initial differences tend to be modified by *sexual or social selection*, such as preference for blondes, small ankles or broad chests, preference for mates who come from the aristocracy, who live on the right side of the railroad track, or who may be free of some stigma such as having a father who stole horses; and *natural selection*, such as comes from relative immunity from malaria, tuberculosis, or other diseases, the tendency toward development of body fat favoring survival in cold climates; and other physical traits that tend to preserve individuals possessing them. Where opportunities for mixing, or hybridization, are reduced, men become more homogenous in physical type. Reduced

opportunities are not wholly a matter of geographical isolation. Man raises many barriers himself by drawing "color lines," creating political boundaries, refusing to marry across religious bars, and the like. Something akin to racial homogeneity gradually develops among such groups as Quakers, Irish Roman Catholics, Gypsies, Andorrans, and Caucasoid Australians or Texans.

The lineage of any person on earth, if followed back far enough, probably leads to some ancestor of every other person. This probability does not deny the vast differences that exist among individuals, nor between various groups of peoples. Forces of differentiation have long been at play and among their effects is the outstanding fact that mankind is divisible into many relatively homogeneous groups as well as three well-defined divisions.

RACIAL GROUPS

Three main divisions of mankind occur: Negroid, Caucasoid, and Mongoloid.

Negroids are characterized by skin pigmentation varying from black to brown, or yellowish-brown. Little body hair is developed, that on the head being ordinarily kinky and sometimes distributed in separate tufts. Most ears are small, noses wide with broad, flat nostrils, and lips thick. Heads are long in proportion to width.

Caucasoids vary in skin pigmentation from pinkish-white, or florid, to dark olive and near-black. Hair is relatively abundant on face and body, that on the head varying between silky straight to curly. Noses are comparatively narrow and projecting, being high at both bridge and root, and lips are thin. Foreheads are comparatively high, chins well developed, teeth small, and cheekbones inconspicuous. Heads of all shapes occur.

Mongoloids have yellowish-light-brown pigmentation. Hair is sparse on both face and body. Each hair is straight, thick, and black. Noses are depressed at the root and low at the bridge, and lips are of medium thickness. Cheekbones are prominent, projecting both forward and laterally. Upper teeth at the front of the jaw commonly project forward. A fold of skin extends across the

upper eyelid and inner angle of the eye giving a slitlike, or slant-eyed effect. Foreheads are of medium height and rounded. Heads are ordinarily wide.

Negroids inhabit most of Africa south of the Dry World, but some live farther north, and many occupy islands extending eastward through the Indian Ocean, East Indies, and into the western Pacific.

Caucasoids inhabit most of Europe, from whence they have moved to practically all other lands. Archaic Caucasoids are also found in India, Ceylon, Australia, and islands flanking the east coast of Asia as far as Kamchatka.

Mongoloids inhabit most of Asia, the Polar World, and large parts of the Americas.

RACES

Some of the more significant races in the Caucasoid division are:

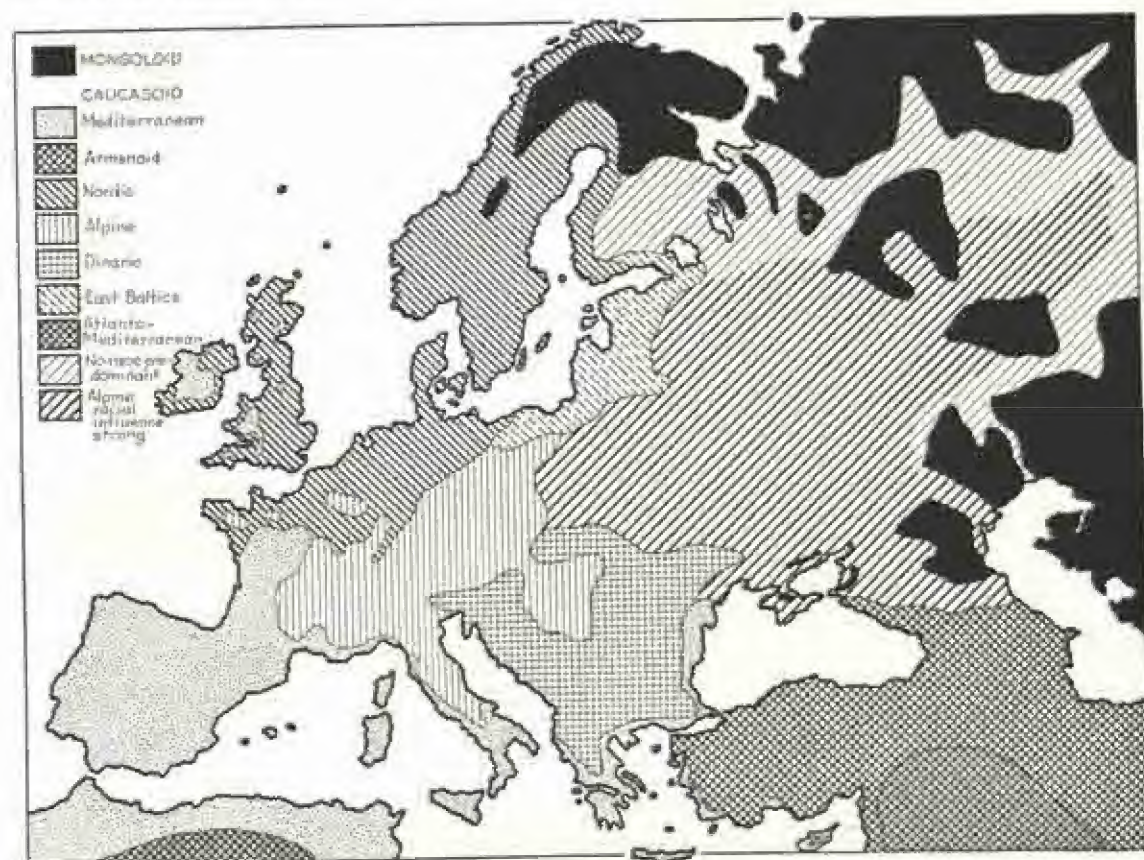
Mediterraneans, who are generally brunet or olive-skinned, with dark-brown or black hair, brown eyes, long heads, oval faces, and medium

stature (5 feet, 4 inches average) with slender bodies during youth which tend to develop obesity in middle age.

Nordics, who possibly have been derived from Mediterraneans through long ages of depigmentation, are generally pinkish in complexion, with blond, yellow, light-brown, or red hair, blue or gray eyes, long to medium wide heads, and rather tall stature (5 feet, 8 inches average) with slender bodies, long necks, and rather flat chests.

Alpines, who are somewhat darker than Nordics, with chestnut-brown to black hair, broad, high heads, abundant body hair, and stocky bodies of medium stature (5 feet, 5 inches average) with short, thick necks, broad shoulders, and thick chests.

Dinarics, who resemble Alpines closely, with even higher and rounder heads, long, deep faces, prominent noses that are likely to be convex, and whose bodies are generally much taller (5 feet, 8 inches average) with very long legs and rather short arms.



Races of Europe

East Baltics, who are lightly pigmented in skin, hair, and eyes, with round heads that are rather flat in back, broad, high foreheads, fairly prominent cheekbones, somewhat concave noses that bring the nostrils into considerable prominence, and rather short stature (5 feet, 4 inches average) with thickset, broad-shouldered bodies.

Mediterraneans are characteristic of the borders of the Mediterranean Sea; they are rather numerous in the British Isles and extend deeply into eastern Africa and southwestern Asia.

Nordics are characteristic of Scandinavia, Iceland, the British Isles, and the Low Countries, and they extend eastward along the European plain into Russia.

Alpines are most numerous along a belt extending from France eastward along the highlands leading into Asia Minor. Many occur in Russia, Siberia, and as scattered groups in various parts of Europe.

Dinarics center in the Eastern Alps and south-eastward toward Greece.

East Baltics flank the eastern shores of the Baltic Sea.

There is a rough correlation between Europe's three culture realms and racial distribution. In general, Nordics are the predominant group in Northwestern Europe and Mediterraneans are the predominant group in Mediterranean Europe. Eastern Europe is more complicated than either from the racial standpoint, with strong Alpine and Nordic elements in close contact with various other peoples, many of whom belong to the Mongoloid division of mankind.

LINGUISTIC GROUPS

Language is wholly a cultural matter. Individuals commonly learn the language of their parents. Infants have neither choice nor preference. Were the offspring of an African Negro taken at birth to China and raised by Chinese he would speak the dialect of his foster parents with the facility of a native Chinese. Nothing in the physical makeup of an individual decides which language he is to speak. We need not be astonished that small children in Moscow speak Russian, a tongue quite difficult for most of us to learn as adults, nor that Chinese children early acquire the complicated intonations of the dialects they speak.

A word of caution should be said about the commonplace mistake of confusing racial and linguistic groups. Many maps purporting to show "distribution of races" actually portray the areas

where particular languages are predominant. In many areas the agreement is close, but there are conspicuous differences elsewhere, and there is little excuse for this particular brand of ignorance to continue.

An enormous number of languages exists; possibly four thousand. They are commonly grouped into families, or stocks, on the basis of similarities in vocabulary, grammatical construction, and origin. Many languages are no longer spoken. Some are kept alive artificially by scholars or other groups—ancient Greek, Latin, and ancient Hebrew being well-known examples. The languages used by earliest man are completely unknown to us.

Indo-European languages. Most European languages belong to the *Indo-European* family, which seems to have originated somewhere in western Asia. Our earliest examples of the use of Indo-European tongues date from 1500 to 1000 B.C. as Vedic hymns of India, and Homeric verse of Greece. Both were highly inflected and contained large vocabularies.

In summarizing the distribution of existing Indo-European languages, we should note that they cover most of Europe and include the majority of its more common tongues. *Germanic* languages are spoken by most people in the Northwestern culture realm, *Romanic* by most people in the Mediterranean realm, and *Slavic* by most people in the Eastern realm. Celtic survives only in Northwestern Europe and Hellenic mainly in the Mediterranean. A zone of linguistic complication extends southward between the Northwestern and Eastern realms. Here we also find tongues of non-Indo-European origin, such survivals as Baltic languages, and an important outpost of Romanic in Rumania.

Ural-Altaic is the language family of second importance in Europe. Well over ten thousand years ago certain important linguistic contrasts were developing among peoples of central Asia. A southern group evolved Indo-European languages while the tongues of northern peoples became Ural-Altaic. The latter family is today characteristic of northernmost Eurasia and has spread into Europe. Many minor Ural-Altaic languages are spoken in the eastern part of Europe. Two main centers lie to the west: one east of the Gulf of Bothnia and the eastern Baltic, the other in lowlands between the Carpathians and the Danube.

Semitic languages are quite unrelated to the great families just outlined. They are extremely ancient, appearing in Babylonian and Assyrian manuscripts, but they have remained very conservative during the passage of centuries. The most widespread Semitic language today is *Arabic*,

which includes variants called, *Syriac*, *Mesopotamian*, *Hebrew*, *Egyptian*, *Tunisian*, *Oman*, *Zanzibari*, and *Maltese*. Only the latter is European, being spoken on the small island of Malta to the south of Sicily. The others occur in Asia Minor, Arabia, and in northern and eastern Africa.

Hamitic languages are distantly related to Semitic and are extremely ancient. The oldest inscriptions in a Hamitic language date from about 5000 B.C.; they are in Ancient Egyptian, which is now dead. Hamitic languages are rather simple from the standpoint of grammar. They have never been used for the development of any significant literature. Semitic Arabic is the literary language today over most territory where Hamitic tongues are used. No area of Hamitic-speaking people exists in Europe, but the European World has invaded Hamitic territory in north Africa.

Caucasic, with reference to languages is a con-

venient term for concealing ignorance or avoiding complication. It is a catchall classification for tongues spoken mainly by small groups of inhabitants of the Caucasus Mountains. In all, the Caucasian list probably exceeds 300 languages, many of which are probably quite unrelated.

Basque is thought to have remote relationships to ancient Berber and the now dead Iberian, once spoken in Spain. It survives at the western end of the Pyrenees as an extremely interesting isolate, almost totally different in root words and structure from any other language in use today. In the fifteenth century, when the language first assumed written form, it adopted the Latin alphabet.

We should not emphasize the complexities of race and language in Europe. Most of the people in the Northwestern culture realm have Nordic traits and speak Germanic languages; those in the Mediterranean realm are Mediterraneans and speak Romanic languages; and those in the East-

Table 4 Summary of the main linguistic groups in Europe

<i>Indo-European</i> (dominant European language family)	
<i>Germanic</i> (Teutonic, mainly Northwestern culture realm, descended from Gothic)	<i>Western Slavic</i> (mainly in territory between Eastern and Northwestern culture realms)
<i>Scandinavian</i> (descended from Old Norse)	Czech, Moravian, Slovakian, Serbian, Polish
Icelandic, Swedish, Danish, Norwegian, etc.	<i>Baltic</i> (once widespread, including dead Old Prussian)
<i>East Germanic</i> (High Germanic, including dead Alemannic, Bavarian, etc.)	Lithuanian, Lettish
German	<i>Ural-Altaic</i> (second most important language family in Europe, dominant in Polar World and across Northern Asia, but extending southwestward beyond Black Sea)
<i>West Germanic</i> (Low Germanic, including dead Old Saxon, Anglo-Saxon, etc.)	<i>Finno-Ugric</i> (includes many living languages spoken east of the Urals)
Low German, Dutch, Flemish, Frisian, English	Finnish, Karelian, Estonian, Livonian, Magyar, Lappish, and a great many others
<i>Romantic</i> (descended from Latin, including many tongues, such as Umbrian and Sabellian)	<i>Samoyedic</i> (closely related to many other languages in northern Asia, eastward to the Pacific, such as Mongolian and Tungusic)
French, Walloon, Provençal, Catalan, Spanish, Portuguese, Italian, Rumanian and others	Samoyedic
<i>Hellenic</i> (descended from Ancient Greek, including many dead languages) Greek	<i>Turkish-Tataric</i> (extremely complex group, mainly Asiatic)
<i>Celtic</i> (once very widespread in Europe)	Turkish, Tataric, Kirghizic, and many others
<i>Continental Celtic</i> (Gaulish now dead, once widespread in France and northern Italy)	<i>Semitic</i> (mainly non-European, Arabic dominant)
<i>Insular Celtic</i> (mainly west coasts of British Isles and Brittany, including dead Cornish)	Maltese
Breton, Welsh, Irish, Gaelic, Manx	<i>Hamitic</i> (almost totally northern and eastern African, encountered in north African encroachments of the European World)
<i>Arryan</i> (parent stock of Indo-European Languages)	Berber
<i>Indic</i> (not represented in Europe)	<i>Caucasic</i> (artificial group including many different languages in a territory of great linguistic confusion, mainly Caucasus Mountains)
<i>Iranic</i> (mainly spoken to the east of Europe)	Circassian, Kartvelian, Chechnic, and possibly 300 others
Ossetic	<i>Basque</i> (possible survival of dead Iberian and other extremely ancient languages of Spain and adjacent lands)
<i>Anatolic</i> (mainly dead)	Basque
Armenian	
<i>Thracio-Hlyrian</i> (once widespread in the Balkans)	
Albanian	
<i>Balto-Slavic</i> (dominant in Eastern culture realm)	
<i>Eastern Slavic</i> (descended from Old Bulgarian, surviving as Church Slavic, mainly in Soviet Union and South Slav territories)	
Great Russian, Little Russian, White Rus-	

ern realm are more mixed, but the predominant physical strain is Alpine and the languages Slavic. Exceptions to these generalizations and the many minor elements appearing in various culture realms may be considered as condiments in a stew composed of rather simple major ingredients.

RELIGIOUS GROUPS

Man probably started various primitive sorts of religious practices and began to hold certain beliefs concerning such matters as his origin and ultimate destination early in his career. The outlines of the long and complicated evolution that led to the association of the theological and moral questions will not be attempted here, nor will the development of the existing great moral religions be traced. Suffice it to say that religion looms large and fundamental in the differentiation of culture traits, that tremendous contrasts arise in ways of life depending on whether populations observe Christian, Mohammedan, Buddhist, or other beliefs and practices. The European World is predominately Christian.

The forms of Christianity are many, and little similarity may be observed between extremes. Classifications may be as complicated as those of languages. Relationships are obvious and direct in many instances, tenuous or remote in others. In general, major distinctions may be made among main groups of Christians on the basis of affiliations by churches. Several churches, such as Coptic and Nestorian, are primarily non-European. All European churches have proselyted far beyond the realms of European culture. Aggressive religious activity has been one of the motivating forces in the New World Revolution.

Nordic, Germanic-speaking Northwestern Europe is the main European stronghold of Protestantism. Mediterranean, Romanic-speaking Mediterranean Europe is predominantly Roman Catholic in church affiliation. Mixed-Alpine, Slavic-speaking Eastern Europe is the territory where the Greek Catholic (Eastern or Orthodox) Church has greatest following. The main religious groupings may be thus roughly identified with the main culture realms. Many are the exceptions among individuals and among rather large groups such as the Roman Catholics in Ireland. Albania and several other places once overrun by Turks remain as insular outposts of Mohammedanism. Judaism has infiltrated all parts of Europe, being particularly developed in cities and along the western margins of the Eastern culture realm. As a rule rural inhabitants of European World countries are more homogeneous in their religious affiliations than urban populations.

NATIONAL GROUPS

The original and smallest grouping of man is the family unit. At first this probably meant little more than the intimate relationship that must exist between parent and child. Later it broadened to include extremely complex kinships.

Next in the order of social units were bands, local groups who likely had close family ties and who exhibited simple forms of cooperative organization that assisted their survival. Gradually came the development of tribes consisting of groups derived from common stocks as a rule and more or less united under the leadership of its elders, headman, or other central authority, such as a chief. Such social units are common today, being characteristic of the Polar World and many other regions. Some are not associated with any particular place, others have developed the idea of *terra patria* to varying degrees. If the principle of ownership of land is recognized at all, it is by tribal units, rather than individuals. The children of Israel remained a unit, whether in Palestine, Babylon, Egypt, or wandering in search of a Promised Land.

Social evolution beyond the tribal basis has taken many directions. Some of these have accompanied assumption of a territorial habitat and political organization that eventually resulted in nationalism.

One of the earliest forms of nationalism was the development of city-states in ancient Egypt, Babylon, Assyria, Persia, India, and China. Foremost among the influences that led to their being were the motivations of self-protection and trade. Plunder was difficult where tribesmen faced a city wall, or population with some sort of military organization. Exchange was easier if sources and markets for particular products existed. Transportation could become relatively safe if certain routes were protected and havens of secure shelter existed along the way. Alliances of city-states led to the formation of patriarchal empires. City-state organization spread to Europe, where traditionally it was maintained in Greece long after great patriarchal empires began flourishing in the Orient.

In many parts of Europe tribal society developed feudal organizations. People inclined to reside permanently in a place and to adopt agriculture as the main basis of their economy gathered rather naturally into population knots centered around the home or land of the headman. Differentiation into ruling and serf classes followed. Most feudal holdings remained small and agrarian, but

local industries developed in some and others were located at sites commanding trade routes. These tended to operate more or less as city-states when their populations attained sufficient size. Feudal units were in the control of hands that might turn to plunder, political aggrandizement, or lust for increased size of land holdings. More successful lords were enabled to build elaborate castles, which might be surrounded by walled towns sheltering considerable populations. Those with best locations, most forceful rulers, or other important assets eventually became city-states or bases for the nationalism that later developed.

The political organizations of the patriarchal empires of the ancient world were generally simple. Such unity as existed centered around the person of the ruler, and the primary motive of his rule was ordinarily defense against aggression, or conquest itself. It awaited the Romans to develop a political organization at all comparable with those that exist today and to extend territorial rule on a truly effective basis. Though it suffered many vicissitudes, the Roman Empire provided the model that the European World has followed during subsequent centuries.

It was to enforce Pax Romana that the concept of "divine mission" entered politics. The boundaries of the Empire stood long as bulwarks against barbarism. Though Germanic bands ended

Roman domination after A.D. 378, Europeans had tasted the glory of empire and subsequently at no time completely abandoned the goal of replacing feudalism by government on a grand, extensive scale. The loosely knit Holy Roman Empire of the Middle Ages was ineffectual in most regards, but its adoption of Latin for religious, commercial, political, and literary use was an act that had tremendous influence toward political unification later on.

The Commercial Revolution that was associated with the Voyages of Discovery ushered in a type of nationalism that is characteristic of the European World today. Commerce led to the rise of a middle class and possession of wealth by persons not included in the nobility. At first the middle class was active in helping monarchs overthrow the feudal system. The movement started in England under Henry VII in 1485. By the close of the Tudor period in 1603, England had become a nationalistic state in the modern sense.

Similar developments occurred in other European countries. Portugal rose as a powerful nation between 1498 and 1580. Spain, under Philip II in 1556, and the Dutch, in 1581 when declaring their freedom from Spain, were pioneers in the general movement. France made early progress in emerging from the feudal system, an end accomplished in 1789. Sweden emerged as a true nation in 1523, and Russia, starting under Peter



Europe in 1815

the Great, attained national stature in 1721 when the Baltic Provinces were taken from Sweden. Prussia attained significant dominance among Germanic lands under Frederick the Great, 1740-1786. Poland had been powerful enough to turn back the tide of Turkish conquest in Europe in 1683. By the end of the eighteenth century most of Europe had emerged from feudalism and developed into a quiltwork of nationalistic powers.

The rise of great monarchies prior to the end of the eighteenth century took place mainly because a middle class possessed great wealth and power. Neither monarch nor merchant favored the continuation of lord and serf social organization. United by common interests, monarch and merchants pooled resources for the purpose of reducing the status of minor lords. Advances in technology, however, soon developed the Industrial Revolution and broadened still further the groups who grew wealthy and who began to figure politically. The tide of self-assertion of middle- and lower-class populations began to turn against the monarchs themselves. The English beheaded a king in 1649 and experimented with middle-class control in 1689. The French Revolution started in 1789. These movements were manifestations of the growing importance of the "common people" in whose hands the nationalism of more recent times has developed.

Napoleon, more than any other individual, laid the foundations for the particular variety of na-

tionalism that has characterized Europe recently and had much to do with the pattern of Europe's existing states. Germany had long been unable to unify. The Thirty Years' War, which ended with the Treaty of Westphalia in 1648, had destroyed most of the wealth, commerce, industry, and half of the population. Weak, rival, warlike states left in the wake of this disaster made little material or political progress until humbled by the Corsican. A persecution complex then developed, much like that following the Treaty of Versailles in 1919, which gradually led to the unification of Germany. Other peoples, too, began realizing oppressions, the weight of yokes, and injustices from which they hoped to escape. Various groups in America threw off European ties and established their own republics. Many of the European states achieved independence: Belgium in 1831; Greece, 1832; Luxemburg, 1867; Serbia, Montenegro, and Rumania, 1878; Norway, 1905; Bulgaria, 1908; Albania, 1913; and many others, such as Czechoslovakia, Poland, modern Hungary, the Baltic States, and Finland, between 1918 and 1920. Thus developed the modern map of Europe.

State boundaries look imposing on maps, especially if emphasized by the device of using different colors for individual nations. Originally they were really very hazy and ineffective lines, but recent developments have had the effect of sub-



Europe in 1914

stantiating their importance. Increasingly they have become barriers to trade and diffusion of culture traits. Most international boundaries are now true breaks with real military, political, and cultural significance.

Before the time of Napoleon the fires of nationalism burned feebly, if at all, in the breasts of most individuals. When we read in history that some particular nation adopted a religion on some particular date, we should interpret the reference as meaning that the head of the tribe, local lord, or monarch had taken such action. It was a matter of immediate consequence to his close associates, particularly his court, but likely of little concern to the human chattels who constituted the greater part of the population. There was little "fatherland" or "mother country" spirit that would lead men to fight for their soil. If a ruler wished to extend his domain or his power, he hired mercenaries, who made fighting a profession and who expected to share in the spoils when successful. This normal procedure was no more condemned than the presence of Swiss guards at the Vatican today. The most powerful leader ordinarily offered the greatest inducements to his soldiers. If the prospects were unsatisfactory, the mercenaries could join his foe, with perfectly clear consciences.

It was France, in 1793, that first adopted conscription laws, requiring men to serve as soldiers

in defending and fighting for their own country. Though the idea was novel, it was successful and spread rapidly. Prussia followed in 1808. In the competition that followed, Prussia led the way. The success of Bismarck in creating a powerful, nationalistic army fastened militarism on Germany in a secure bond. It was so admired by political leaders that other states started organizing their fighting forces along Prussian lines, even to the extent of hiring Prussian officers to perfect the details. Nationalism became an armed force. Boundaries gained meaning.

The significance of boundaries today is totally different from anything known in earlier times or in many non-European parts of the world at present. Changes in laws, legal tender, gauges of railroads, and many other barriers emphasize each line between nations. Even such culture traits as language and religion are forced, more and more, to assume distributions agreeing with political subdivisions. The increasing availability of education to larger and larger segments of the population emphasizes the importance of state languages, even though they be minor tongues. National prides force the substitution of languages practically without literature, such as Irish, for major tongues of first-order literary importance, such as English. High protective tariffs, started by Germany in 1879, and growing governmental interference stifle trade. It has become impossible for many kinds of goods to cross boundaries at all. Many markets vanish because things



Europe in 1937

formerly available no longer reach them for reasons of political nationalism.

Nationalism is essentially a new cultural control. It was nowhere highly developed until the early part of the nineteenth century. It cannot change racial inheritance, except by extermination, but it can go far in forcing people to adopt certain languages, religions, and other culture traits. The influence of nationalism has been so profound that it is now possible to organize an outline of the culture distribution of Europe and many other parts of the world according to political units, such as individual nations.

In the Northwestern culture realm are: The British Isles, divided nationally into the United Kingdom and Ireland; the Scandinavian lands, Norway, Sweden, Denmark, and Iceland; the Low Countries, Netherlands and Belgium; and, in Central Europe, much of Germany. In the Eastern Realm is most of the European and Sibe-

rian territory of the old Russian Empire. In the Mediterranean Realm are: Greece, Italy, Spain, and Portugal. Between these main culture realms of the European World are transitional zones, of which a *Shatter Belt* extending south from Finland to the northern part of Greece and westward to Vienna is the most complex in regard to nationalities. This belt includes Finland, the Baltic States, Poland, Czechoslovakia, Hungary, part of Austria, Rumania, Yugoslavia, and Albania. In the past, much of this territory was in the hands of either Russia or the Austro-Hungarian Empire. Most of it lies along the zone of clash between Northwestern and Eastern culture realms. Farther to the west, France and Switzerland occupy territory transitional between Northwestern and Mediterranean culture realms, constituting a mild western Shatter Belt.

7: Introduction to the British Isles

The British Isles, as a region in the Northwestern European Culture Realm, is about as distinctive and unified as any unit we are to consider, yet it exhibits considerable diversity. The climate is typically mild and maritime, but it includes contrasts that have been highly significant to man. Most of the surface lies on the European Plain, yet little territory is actually flat and parts of the Northwestern Highlands reach Scotland and Ireland. The population is predominantly Nordic, but considerable Mediterranean and Alpine admixture is present, and in some places dominant. A Germanic language is almost universal, but strong residues of Celtic-speaking peoples remain, most of whom are intensely loyal to their ancient tongues. Several major political units exist, with Protestant religion dominant, except in one, which is intensely Roman Catholic. Most national boundaries are old, but important changes have taken place recently. Industrialism is highly advanced and population is mainly urban, yet rural life persists, some of it in rather primitive form. To the east lies the very focus of Northwestern European culture, the North Sea, yet Mediterranean influences are potent.

PHYSICAL GEOGRAPHY

The British Isles consist of some 5,500 islands and rocks distributed along a north-south zone of about 800 miles as a barrier between the North Atlantic and the North Sea. Great Britain, the largest, is between Utah and Oregon in size with an area of nearly 89,000 square miles. Ireland ranks second with more than 32,000, and the combined areas of all others is less than 500 square miles. Altogether the total area is slightly less than that of New Mexico, yet it supports a population in excess of 50 million, or more than any other country in Europe excepting Germany and the Soviet Union. Population density averages about 540 per square mile, which is greater than that of Italy (386), Germany (368), France (192), Spain (119) or any other European country, except the small nations immediately across the North Sea.

A popular idea that these islands are disappear-

ing is contrary to physical facts. Erosional loss to wave attack between the years 1875 and 1910 amounted to less than 7,000 acres, but it was more than offset by an addition of more than 37,000 acres of new land that formed along coasts. Losses occurred chiefly along the chalk cliffs of the southeastern coast. Additions were mainly in the form of pebbly beaches and coastal marshes.

Winds from the North Atlantic bring about the same air temperature at all seasons. The average temperature at Valentia on the coast of Ireland is 48° F. during January, or about the same as that along the Mediterranean coast of France. The Hebrides, off the northwest coast of Scotland, are as warm as Bordeaux. Winter winds cool somewhat as they travel east. Along a line from London to Aberdeen the January temperature is about 40°. Summer temperature along the coast of Ireland is only a few degrees higher than in winter, so that grain ripens with difficulty. Winds warm rather rapidly as they travel east, so that



British Isles: precipitation

July has an average temperature somewhat above 60° over much of southeastern Ireland and over all but the northwesternmost part of Great Britain. The northward temperature gradient is about 1° per 100 miles in summer. London has an average July temperature of 64° and the Shetland Islands, north of Scotland, 54°. Hottest days rarely reach 80° anywhere.

Air from the North Atlantic brings excessive moisture to all west coasts and mountain slopes. Fog and drizzle occur day after day, particularly in winter. Rain is abundant in all months, but the wettest season is the fall, just when crops are ready to harvest. Annual precipitation on lowlands varies generally between 30 and 40 inches, an amount that is excessive where temperatures are low and evaporation slow. Mountain localities in both Great Britain and Ireland commonly get over 100 inches. The wettest place in all Europe appears to be Llyn Llydaw, a mountain in north Wales, where annual rainfall exceeds 200 inches. Places lying in the lee, or downwind, of mountains experience the effects of "rain shadow." Air that passes across the mountain backbone of Great Britain has lost so much moisture on windward slopes and has been heated so much in the descent of lee slopes that reduced precipitation is characteristic of the eastern sides of the main island. In some parts of Yorkshire, northeastern England, annual rainfall amounts to less than 20 inches, and in London it is but 24. Very little snow falls on lowlands. London had flurries on 14 days of the average year, but snow seldom lies on the ground for more than a few hours. At Edinburgh snow falls on 21 days and lasts longer, but only higher mountains are normally blanketed for several weeks or months and all snowbanks disappear during summer.

The British Isles were extensively forested before man entered the scene in large numbers. Such deciduous trees as oaks and beech grew on lowlands. Pine and birch covered many of the uplands. Grass grew rankly on lowland clay soils that resisted forests, and scrubby growth occupied the most sandy lands. Broad marshes, called *fens*, existed along several coasts, especially to the north of the Thames Estuary. Extensive wet *bogs* with such vegetation as grass and sedge covered much of central Ireland.

The tree line is rather low because all of Great Britain lies north of 50° N. Forests rise only to slightly more than 1,000 feet in southern England and Wales. Above them are tundra-like *moors*, where low shrubby heather and small tufted plants remain gray at most seasons but turn purple with

tiny blossoms in late summer. Extensive deposits of *peat* have developed in undrained lowlands and on many uplands in places where plant remains decompose slowly under conditions of excessive moisture. Many highlands were scraped bare during the Ice Age and remain rocky today. Wet, westward slopes develop rank fern growth, tall grass, and other bright green plants, especially in Ireland.

Animal life was abundant in the prehistoric British Isles, but man has caused revolutionary changes. The brown bear, wolf, wild boar, beaver, and a host of other species, including the magnificent Irish elk, have disappeared entirely. The wild ox and red deer are all but gone. Relatively few foxes, badgers, otter, wildcats, or other large mammals remain, except in a few remote locations or in the semiprotection of preserves. There are few snakes in Britain, and only one poisonous variety. Ireland has none. Many small creatures have benefited by man's presence, not only because he makes an easy food supply available but also because he has reduced their natural enemies. Foremost among these is the rat, always one of man's closest, if unwelcome, companions. Domestic animals, of course, have been favored, and many occupy the particular niches in natural environments that were formerly the support of wild animals.

CULTURAL SUCCESSION

During the stages of furthest continental-ice advance, the margins of Ice Age glaciers reached almost to southern shores of Great Britain. Earliest man was thus denied the possibility of living north of the Thames for rather long periods. When interglacial stages were developing, he followed ice margins northward. Migrations in accordance with the waxing and waning of ice were slow, many hundreds of thousands of years occurring between stages of glaciation and relative deglaciation. Man has never found difficulty in using the habitat along ice margins. Various peoples have lived successfully along the coasts of Greenland and archaeological evidence is conclusive that prehistoric men could live close to the ice. Stone flakes thought by some to be the product of man's work almost a million years ago, about the time that the first evidences of an Ice Age were becoming evident, occur in gravels along the English coast north of the fens. These "Ipswichian flakes" are regarded by some as the earliest signs of man's industry. Various other evidences of Ice Age man occur in Great Britain. Notable finds have been made near Plymouth, in Suffolk, and to the north of London.



British Isles: Nordic Invasions



Counties of England

along the coasts of Ireland. At this time, Norsemen were also going to the coast of France. Soon they went to Iceland and across the Atlantic to Greenland.

King Knut (1016-1025) established sovereignty not only over all of Great Britain but over all other North Sea coasts as well. His reign marked the only period in history when all peoples facing the North Sea focal area were unified politically. Winchester was his capital.

British place names are rich in memories of these historic events. Most natural features, such as hills and streams, retain names of Celtic origin. Almost all names in the Shetland Islands and many along the coasts of Scotland and Ireland are Danish. Endings in *-ay*, such as Moray and Stornoway, or *-by*, such as Grimsby, Whitby, Kirby, Kirkby, Shelby, and Derby betray Scandinavian origin. Many lie well inland. Danish names along the Irish coast include Wexford, Carlingford, and Strangford.

William the Conqueror (1066) was the last successful military invader of the British Isles and the first to extend rule over Cornwall, Devon, and part of Wales. For the second time, law and order of the Roman type reached England, but

now it was imposed, not on primitive Celts but on Germanic peoples, who appeared uncouth and culturally backward to the invading Normans. The various governments of England and Wales were welded into a bond that has remained permanent. Saxons began to supplement sheep raising with the arts of agriculture. French words appeared in their vocabularies, particularly to cover ideas associated with refined living. Language gradually unified into an archaic type of English that was spoken by most of the common people as early as the twelfth century. It was not until 1363, however, that French was abolished as the official language of the country. Between the thirteenth and six-

teenth centuries a culture was being shaped that became distinctively English. This was the culture of "Elder England."

Few would have predicted, even in the latter part of the sixteenth century, that more than 200 million people would speak English as their native tongue or that Great Britain as a political power faced the destiny of controlling some 14 million square miles, nearly one quarter of the earth's land surface; 500 million people, nearly one quarter of the earth's population; or that its people would rule the seas and own over one quarter of the world's transportation facilities.

In ancient times and during the Middle Ages, Britain was a primitive outpost on the very fringe of Europe. Pope Alexander VI ignored it completely when he divided the New World between Portugal and Spain. Continental Germanic peoples long monopolized English trade, then passed it on to the people of Flanders. Invaders had come at will, but few had bothered to undertake the task of conquering such unimportant territory. Peoples on the mainland had long known the brilliant advancements of the Renaissance before England was of any consequence whatever. To Europe it was only a producer of limited amounts of wool and food for the use of more advanced people on the mainland side of the Channel or North Sea. It was not until 1546 that anyone had ever bothered to map England.

The advantages of insularity were long in being realized, though proximity to the continent benefited the inhabitants of Britain in many ways. Every invasion had brought cultural enrichment and many had added important human elements for the building of a new nation. Alpines and Nordics combined ethical and moral codes into a social order that attracted peoples from other lands. Many who felt oppressed at home regarded England as a haven of unparalleled freedom and fair play. Immigrants arrived with new skills. Insularity brought peace after the English were powerful enough to protect their shores.

Invasions of England were thwarted in 1588, 1805, 1914, and 1940. The 21 miles of water between England and the mainland offered a security that even Air Age warfare failed to destroy. The position of England has been such that it could borrow what it chose from the continent, maintain its own identity, and stand aloof from most serious conflicts on the mainland. This advantage is rapidly vanishing in a world of air transportation.

The first suggestions of Empire appeared during the reign of Queen Elizabeth (d. 1603). They resulted to a very considerable degree from a simple discovery in 1539. It was then that British seamen acquired the art of tacking, or sailing

ships quite closely toward the wind. English privateers, equipped with this knowledge, soon became masters of the sea. English warships used it to their advantage in conquering the mighty Spanish Armada in 1588, ending for all time any possibility that Spain might rule the British Isles. Commercial interests were not slow to take advantage of the superiority of British seamanship. Several important trading companies were organized for purposes of engaging in overseas commerce. Thus started a Commercial Revolution that eventually established the Empire. The pattern of growth was not of a purely deliberate design. The flag followed the trader, innocently as a rule, but positively.

ELDER ENGLAND

Elder England, the territory where English culture was nurtured, is the attractive agricultural region of southeastern Great Britain, where soils are good and precipitation moderate enough to permit the harvesting of crops. Germanic peoples colonized this fine territory. Its frontier lay along an irregular line extending from the vicinity of Portland Isle on the south coast of Dorset to the vicinity of Scarborough on the east coast of York.

The nucleus, or cradle area of English culture lay in and around London Basin. Angles, Saxons, and Jutes had blended to form the dominant population. English here evolved into a language different from the several Germanic dialects of the colonizers. Wool served as the export commodity that first aroused interest in commercial enterprise. The woolsack became the symbol of the Lord Chancellor as President of the House of Lords during early days, and so it has remained.

When emphasis turned to agriculture after the Norman Invasion, southeastern England was found to be one of the finest *granaries*, or regions capable of producing surplus food, along the entire European Plain.

The Commercial Revolution centered on slopes toward the North Sea, around whose shores the greatest concentration of important seaports on earth was to develop. The Thames Valley lay not only in the heart of an excellent and productive soil region but led downstream to an estuary capable of becoming the world's greatest seaport. There was an additional advantage of proximity to the place where Britain most closely approached the mainland. London, at the head of the estuary, was destined not only to eclipse the political significance of West-Saxon Winchester but also the commercial significance of Yarmouth (fishing), Ipswich (seaport), Norwich (seaport), Colches-

ter (first Roman colony), and many other population centers that extended north to York, the Roman capital.

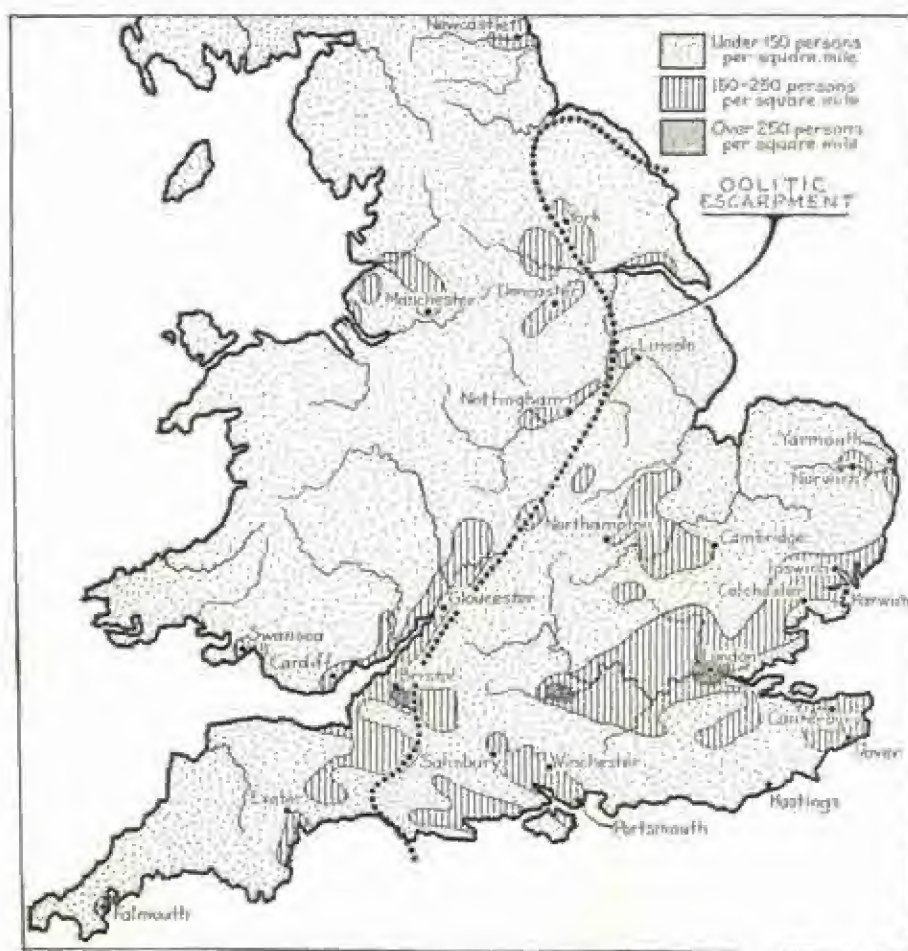
The peculiar advantages of Elder England depend to a considerable degree on its geological setting. It is a region of comparatively young rocks, many of which help form fertile soils. The western boundary of the young rock region extends from Portland Isles on the English Channel, to Scarborough on the North Sea. Outcrops of a resistant layer of rock—called oolite (oo, egg; *lithos*, rock) because it is composed of innumerable little spherical objects that resemble fish eggs—follow a discontinuous ridge that bears such local names as Cotswolds, Northampton Upland, and North York Moors. Facing the older rocks of western England is the oolitic escarpment, a steep slope that descends to such lowlands as the Vale of Taunton, Plain of Somerset, Vale of Evesham, and Vale of York. The oolite

slopes gently eastward under the younger rock formations of Elder England.

Minor folding of the young rocks of Elder England, coupled with the fact that some layers are far more resistant to erosion than others, gives southeastern England fair topographic diversity. London Basin, along the lower Thames, follows a major downfold and is therefore surfaced by the youngest rocks of all. Chalk rocks and layers of sandstone stand as ridges, while belts of clay tend to become valleys.

Agricultural values are low in the uplands along the outcrops of oolitic and chalk rocks. Population density is also low. But in the various *vales* and other lowlands are some of the best lands and most densely settled parts of rural England. Here some 10 per cent of the country produces about half of its wheat.

A minor uparched fold complicates geological patterns somewhat in territory between the Thames Valley and the Channel coast. The rocks in the central part of the fold are older than those



England: population density in 1719

on either side, a structure described as anticlinal (*anti*, away; *cline*, slope). In the heart of the anticline is the Weald. This name is derived from the German *wald*, meaning wood or forest, hence hills, because they were originally wooded. Another form of the word, *wold*, is also rather common in English. In Roman times the Weald was known as *Anderida Silva*. The Saxons changed this to *Andredsweald*. Andred later dropped out of the picture.

Local place names, such as the Forge, the Furnace, Cinder Hill, and Hammersford recall the fact that the Weald once possessed the essential raw materials for primitive smelting and manufacturing; iron ore and forests. Here was the original industrial part of Great Britain. Until the end of the sixteenth century the Weald was the main producer of such local needs as horse-shoes and other iron wares, including primitive cannon. After local forests disappeared, wood for fuel was supplied from nearby counties of Kent, Surrey, and Sussex. The last iron was smelted in 1830. Endowed poorly for agriculture, the central clay lowlands and flanking sandy hills of the Weald remain backward and sparsely populated. As late as 1771 it was possible to see such scenes as a lady riding to church in a carriage drawn by six oxen.

On either side of the Weald are the vales of Kent (north) and Sussex (south). Beyond these rise chalk hills with bare brows, steep slopes, and short-grass cover. The northern ridge, North Downs, parallels the Thames Valley. South Downs lies between the Weald and the Channel coast. Some of the chalk hills exceed 1,000 feet in elevation. Early Saxons raised sheep on these rather barren slopes, first exporting them to the continent as live animals. Later they clipped wool and exported it to Belgium, a country relatively advanced in textile industry. After the end of the fifteenth century much of it went to Italian merchants in such commercial city-states as Genoa, Pisa, and Venice. When local demands for meat increased the Downs turned to specialization in sheep for mutton, their chief use today. The aver-

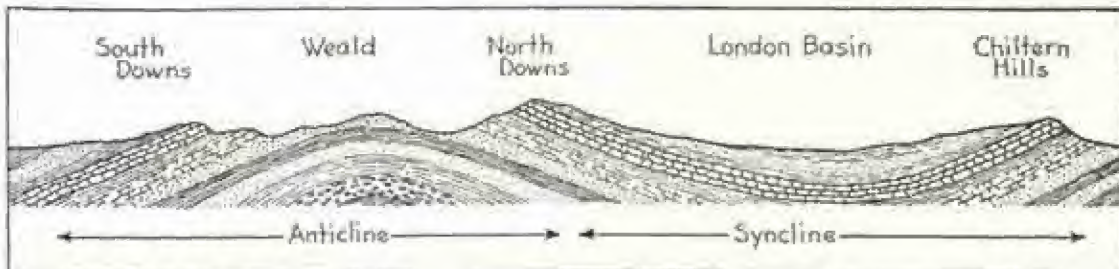
age population density in the Downs is but two per square mile at present, whereas in nearby lowlands it commonly exceeds 200 in rural areas and in more favorable sites reaches 300.

Lands similar to the Weald and Downs lie to the north of the Thames Valley, but the rock strata are flatter, the ridges of more resistant rock attain less elevation, and lowlands of less resistant rock are wider. Many stream-cut gaps through hills have been useful in determining routes of communication.

The Wash is a broad, shallow indentation on the east coast between Norfolk and Lincoln. When ships were small, Boston, Kings Lynn, and other places on shallow streams leading to The Wash were important ports. Ships later increased in size rendering many ports along the east coast obsolete. Some fell into complete disuse, while others continued to serve as bases for small craft used for fishing or for pleasure.

Behind The Wash are the Fenlands. Most of this territory was originally marsh, ordinarily too wet for use and subject to periodic flooding. Above the general level were a few infertile, gravelly "islands." These were remote and isolated places protected by wet surroundings. The town of Ely escaped conquest by the Normans but this old isolation has long since passed. Dutch engineers started drainage projects as early as 1628 and these have been continued with the result that a large tract of productive agricultural land has been added to Elder England.

The Humber Estuary lies upcoast from The Wash. Useful lowlands lie along the Humber, and its many branches have determined some of England's most important avenues of transportation and communication. A southerly branch, the Trent, leads far toward the two greatest indentations on the west coast, Bristol Channel and Liverpool Bay. From the Trent many easy passes lead to the Thames Valley. Westward branches of the Humber rise west of England's highland backbone. Northern branches lead through the Vale



Geologic section through southern England

nons on farms scattered among groves of trees that remain residually from initial forests. The *dulesmen* on these farms are extremely conservative and cling to old customs with tenacity.

To the north, at the narrow "waist" of Great Britain, are the Cheviot Hills, a low range with trend transverse to that of the Pennines. True forests originally attained an elevation of but 600 feet, above which the vegetational cover was reduced to scattering birch and conifers and extensive grasslands. This territory was long devastated by wars and border raids. Today it serves as one of the best pasturages for wool-producing sheep in the British Isles, supporting more than one head per acre.

To the north and west of the Pennines is the Cumbrian Dome, or Lake District, culminating in Scafell (3,200 feet), the highest peak in England. More or less radial valleys lead to peripheral lowlands. These were scoured by ice during the Ice Age. Their sheer sides and rather flat, meadow-studded floors are so picturesque that the region has become one of England's most popular resorts. Windermere, largest among the valley lakes, has an area of about nine square miles. The crags above are ordinarily obscured by cloud. Lake District rainfall is so excessive that much of the upland is even too wet for grazing cattle or sheep.

The Pennines lose identity southward, where uplands spread into the comparatively low Midland Plateau and westward to the higher plateau of Wales. Midland Gap, between the southern end of the Pennines and Wales, offers easy access to the plains of Lancashire and Cheshire on the Irish Sea coast of western England, both from the lowlands of Elder England and those of the Severn to the south. The Valley of the Trent leads from the Humber Estuary toward Midland Gap. Easy routes also lead to Hampshire, on the Channel coast.

WALES

Wales is mainly a plateau of old rock, rather deeply scoured by glacial valleys. At elevations in the neighborhood of 1,000 feet much of it appears as rugged as the Alps at 7,000. Trees hardly grow above the 1,000-foot contour and few fields are plowed above 600. The uplands are strewn with boulders and support extensive tracts of wet peat. Snowdon, in the northwest, is the highest British peak south of the Scottish Highlands, having an elevation of 3,560 feet. Its vicinity is the rainiest in Europe. Only the eastern lowlands toward Midland Gap and the Severn escape persistent cold winds, heavy layers of cloud, and excessive rains.

Though the English conquered Wales in 1276, it long remained a land of Anglo-Norman barons whose life and culture in castle towns was far removed from that of the Celtic natives. The latter lived an extremely primitive life, occupying *hafod-ty*, or little huts among the hills, in summer during the season for pasturing sheep. In winter they came down to *pentre*, or valley dwellings, when sheep had to be fed on lowland hay or fattened on oats.

SCOTLAND

A glance at a map of Scotland will indicate that it is a land of conspicuous topographic grain. The main highlands and lowlands, the most conspicuous valleys, estuaries (firths, fiords), island chains, and long segments of the coasts trend in more or less northeasterly direction. A geologic map will reveal the main reason for this topographic grain; practically all belts of rock outcrop have this same orientation.

Scotland may be divided into three main topographic parts: Southern Uplands; Midlands, or Central Valley; and Highlands. The Southern Uplands lie toward the English border and expose the same ancient rocks that occur in the Pennines. In the Midlands are rocks somewhat younger in



Scotland: physical divisions

age, similar to those between the Pennines and the oolitic escarpment. The Highlands to the north are composed of extremely ancient rock, much of which has been metamorphosed, or physically and chemically altered by having experienced a very complicated geological history, involving extreme folding, crumpling, and crushing. The Hebrides, Orkney, and Shetland islands are summits of now-detached and partially submerged portions of the Highlands.

The Southern Uplands supplemented the rather barren Cheviot Hills as an effective boundary and barrier zone between Elder England and the cultural nucleus of modern Scotland, which lay in the Midlands to the north. Precipitation is excessive, especially westward near Mt. Merrick (2,700 feet) the culminating summit. Valleys become more useful eastward, where there is less rainfall and better pasturage for sheep. The Valley of Tweed is the most eastern and the most populous large lowland, long famous for its woolens from Cheviot breeds of sheep. In more recent years this region has prospered in consequence of its ability to supply milk to cities.

The Scottish Midlands is a low belt between the firths of Clyde and Forth. These estuaries are less than 30 miles apart at their heads. Little truly flat land occurs. Streams flowing into the firths wind around low hills, many of which are of volcanic origin. Rainfall is excessive, especially in the west, so that much land is doomed to raise oats, a cereal defined by Samuel Johnson as being food for horses in England and for men in Scotland. The lowlands widen eastward and rainfall decreases enough to permit wheat raising. This cereal produces far more food energy per acre than oats, barley, rye, or other common cereal crops grown in Europe.

The fertile "carse lands" around the Firth of Forth became Elder Scotland, and Edinburgh rose to prominence in the best soil region, just as London did in Elder England. Falkirk, near the head of the firth, had a little iron ore and wood for fuel. Water power was also available for pumping bellows. This combination enabled it to become the original industrial center of Scotland. For a short period it was the most important iron-producing town in Europe. Edinburgh thus had its equivalent of the Weald.

The Highlands are divided by Glen More and terminal estuaries into northern and southern parts. Glen More is remarkably straight and narrow. Such furrows ordinarily develop along lines created by *faulting*, or fracturing of the rock of the earth's crust by relative displacements of consid-

erable blocks on either side of the break. Glen More has been deepened both by glacial action and stream erosion. Northeastward it opens into Moray Firth; southwestward into Loch Linnebe, the Firth of Lorne, and the Passage of Colonsay. Through it was constructed the Caledonian Canal, with many locks, between 1804 and 1822. Loch Ness and Loch Lochy provide long stretches of open water. This waterway serves only local needs at present.

The Northwest Highlands are the direct continuation of the highlands of Scandinavia, which they resemble in geologic history, glacial sculpture, climate, vegetation, poverty of natural resources except water power, and population. The Shetland and Orkney islands were convenient stepping stones during the centuries of Scandinavian emigration to the British Isles. The Hebrides were known as the Western Isles to the Celtic Scots, but as *Suthreyjar*, or Southern Isles, to the Norsemen. Sutherland at the northern end of the mainland was a Norwegian possession until the end of the twelfth century.

The Northwest Highlands emerged from the Ice Age with rocky, barren surfaces that today remain almost unchanged. Deep valleys were scoured by ice streams wherever less resistant rock occurred. Many of these steep-walled passageways filled with water after the ice retreated becoming either land-locked lakes or flords open to the sea. Loch Morar, in western Inverness, is the deepest lake in the British Isles, having been sounded to a depth of 1,070 feet.

Northwestern Highlands have a climate sufficiently mild to melt winter snows during the summer, even in high and sheltered locations. Excessive precipitation encourages growth of ferns and grass to the west in Britain's most rugged landscapes. Centrally and to the northeast the dominant vegetation is heather and such small plants as are to be found in and near the Arctic tundra. Plant remains accumulate between rock exposures and form peat.

To the west of the Minch lie the Hebrides, which resemble the Northwestern Highlands in most respects, but on a small scale. Northward are the partially agricultural Orkneys with 28 habitable islands separated from the mainland by Pentland Firth. Farther away are the rugged Shetlands with a culminating peak reaching the elevation of 1,650 feet, a region of pony pastures and fishing bases.

Just south of Glen More are the Southern Highlands. Highest peaks lie close to the Glen. Ben Nevis attains 4,406 feet, highest in Great Britain. A considerable area rises above 3,000 feet, but only half a dozen summits reach 4,000. The

topography of the Southern Highlands has been likened to the wavy surface of the open sea. Definite ranges are absent and irregularly distributed peaks rise to rather uniform heights.

The name Grampians refers to the dissected plateau of the Southern Highlands. In their wooded vales arose the many clans of Highland Scotland. Toward the east are better agricultural lands and along the coast the best bases for North Sea fishing. Some 90 per cent of the Highland population lives in these more favorable areas. Aberdeen is the fourth city of Scotland.

The Scoria of Roman times was inhabited by warlike Picts, a people of Alpine stock. Celtic Scots, who originally dwelt in Antrim in northeastern Ireland, spread eastward to the larger island crossing the North Channel in about the fifth century. St. Columba established Christianity among these people in 563 at Iona off the west coast of Mull. By 843, religious and political unity was achieved throughout northern Scotland.

Anglo-Saxon influence gradually crept northward along the eastern coast of England, across the Valley of Tweed, and into the agricultural eastern part of the Central Lowlands. Edwin, King of Northumbria, established a fortified outpost at the site destined to become Edinburgh as part of a general expansion of Germanic peoples to as far north as Aberdeen. On carefully selected land, the Germanic settlements prospered, so that ultimately political power fell into Anglo-Saxon hands.

Scottish kings generally maintained their capitals at Dunkeld on the Tay not far north of Edinburgh. The culture that developed among the Germanic peoples was in many ways similar to that of the English and gradually spread to the Celts, who, more and more, were becoming the inhabitants of the Highlands. Roman Catholicism long remained the prevailing religion both in the Highlands and Central Valley.

The development of strong rivalries between Germanic Scots and Germanic English led to a long series of border wars that eventually established the boundary between England and Scotland in the middle of the thirteenth century. Raids across the boundary continued, however, until the seventeenth century. By 1603 the countries were combined under a single crown, but it was not until 1707 that the Parliaments were united and a single customs union existed in Great Britain.

Edinburgh occupied the same position in Elder Scotland that London enjoyed in Elder England. Both cities lay in the midst of the least rainy and best agricultural tracts of their respective countries. Both dominated cultural development, trade, and politics.

IRELAND

The uplands of the northern third of Ireland, above a line between Gullway Bay and Belfast Lough, resemble the Highlands of Scotland in climate, rock types, glacial history, and scenery. Antrim, the county nearest Scotland, shares with Mull, Arran, and the western end of the Central Lowlands a widespread sheet of dark, basaltic lava. This volcanic rock weathers into excellent soils. Unweathered exposures give rise to extremely interesting and picturesque scenery along coasts. The mountains of Donegal, Mayo, and Connemara along the northwest coast are excessively wet, experience little sunshine, and are largely waste. Lands too wet for use cover over three quarters of northwestern Ireland. Least favored by nature is the western part of the province of Connaught, where highlands are wild and rugged and most lowlands are too wet for more than a token population.

A small part of northeastern Ulster, the Lough Neagh depression, resembles the Central Lowlands of Scotland. This relatively good agricultural land supports a dense population. The Mourne Mountains and a hilly tract that points toward the



Provinces and counties of Ireland

heart of the island are the physical equivalents of the Southern Uplands of Scotland.

A marginal belt of highlands that fairly rim the southern half of Ireland are the physical equivalents of the plateau of Wales. These start near Galway Bay on the west coast, culminate in the Mountains of Kerry in the southwest, and continue eastward, along the southern coast, to the Wicklow Mountains just south of Dublin.

The topography of Ireland is much like a saucer, but a gap exists along part of the eastern rim between the counties of Wicklow and Down on the Irish Sea. Within the rim lies the extensive Central Plain or Lowland.

Even the Central Lowland is excessively wet. The Emerald Isle has more moss, more grass, less heather and shrub, than corresponding parts of Great Britain. Bright green is the typical color of landscapes. Over 2 per cent of the island is surfaced by lakes and ponds. Peat bogs cover about 15 per cent of the area. Drainage is uncertain and ineffective nearly everywhere. In the 250,000-acre Bog of Allen, west of Dublin, wet peat attains a thickness of up to 50 feet.

The bedrock limestone of the Central Lowland has been covered irregularly by moraines. Many of these cross former stream courses. Lakes have formed as a result of blocked drainage. Many old lakes have become filled with peat, so that they have been converted into flat bogs. The typical Irish river is only intermittently confined to a single channel. Here and there along its course, it spreads out to become a lake or loses identity in crossing a bog or wide marsh. Most of this irregular drainage leads eventually into the Shannon, the longest stream in the British Isles. One fifth of all Ireland drains into this 190-mile river. In crossing the Central Lowland, from Lough Allen to Killaloe, the fall is but 36 feet in 110 miles. Here the "rim of the saucer" is breached. A sharp drop between Killaloe and Limerick is now utilized to produce hydroelectric power. Below this drop the river enters a long narrow estuary leading to the Atlantic.

When Celts from Great Britain first reached Ireland they encountered Mediterraneans in a Stone Age stage of cultural development. Celts soon dominated and settled in the better parts of the Central Lowland. These people were the original Scots. As population grew, the direction of spread was northeastward into the relatively good region of Ulster. St. Patrick brought Christianity to Ireland in the middle of the fifth century. Monasteries were soon established at many points in the Scottish territory. Scholarship advanced

rapidly, so that it surpassed by a wide margin that of Great Britain. Irish scholars gained a very favorable reputation on the continent.

Danes and Norwegians began settling Irish coasts in the early part of the ninth century, initiating foreign commerce, particularly from Dublin. Various uprisings against the Nordics culminated in 1170, when Richard de Clare, a Norman, expelled them from Dublin and the east coast. Thereafter followed an immigration of English, who made Dublin their stronghold. This influx of new population grew to large proportions and did not cease until the end of the sixteenth century. Many of the English moved into rural parts of Ireland, where some rose to become an Anglo-Irish aristocracy. As a class, they adopted Irish ways and became culturally Irish. Quite different were the English who remained in Dublin and its immediate surroundings, a region that became known as the English Pale. To these intensely English people, the Gaels and other inhabitants of Ireland seemed crude and primitive. "Beyond the pale" came to mean beyond the limits, privileges, or protection of the Church, hence of low social order. Northern Ireland was invaded by Scottish immigrants, especially during the sixteenth century when economic conditions at home were very bad. By the end of the seventeenth century, only one sixth of Ireland remained in truly Irish hands.

Henry VIII had been proclaimed King of Ireland, but it remained for Elizabeth's generals to conquer it. The Irish long toiled for foreign landlords. The rural Celtic population retained its native tongue until the middle of the nineteenth century. The Irish remained steadfastly Roman Catholic, whereas their foreign masters, English and Scots, adopted Protestantism. Fires of deep resentment burned in Irish breasts toward the Protestants in the northeast and the English everywhere. At long last, about five sixths of Ireland, 26 of its 32 counties, became a Republic in 1919 and was granted dominion status within the British Empire in 1921, with the name Eire. Strong attempts are being made to revive the Celtic language. The resentment against the British is so strong that the Constitution of 1937 rejects any Empire connection whatever, a position confirmed in 1948 and 1949 by refusals to enter into mutual-defense pacts with the British.

OTHER ISLANDS

Most of the other islands of the British group are small and culturally insignificant. A few rise above that category.

The Isle of Man, in the northern part of the

Irish Sea, is a detached fragment of the Southern Uplands of Scotland about thirty miles long and ten wide. It is occupied by some 49,000 Manxmen, who raise sheep on slopes culminating in a summit 2,034 feet above sea level. Oats, the principal cereal crop, grows in scattered lowland valleys. The main sources of revenue, however, come from other directions. Manxmen fish for herring in the Irish Sea during most of the year and for mackerel along the southern coast of Ireland each summer. They also provide attractive summer resorts for the English, especially the inhabitants of Liverpool and other parts of Lancashire.

The Channel Islands are really not part of the British group. They lie along and near the coast of France and are culturally French. Politically and economically they are English. The British lost Normandy in 1204 but retained the islands off its coast.

Jersey and Guernsey share somewhat equally most of the 985-square-mile area and the 103,000

population of the Channel Islands. When 40- and 50-foot tides ebb, these islands double in area. A drop in sea level of 120 feet would connect them all into a single body of land. An extremely mild climate permits their French inhabitants to produce on their small farms the first potatoes, many fruits, and luxury vegetables that reach the London market each spring. Though the coast of France lies only 15 miles from Jersey, all economic ties are northward. Few contacts are maintained with the French of the mainland. Southampton and London are the ports to which most Channel Island steamers run. The English people, attracted by the mild climate and quaint landscapes of Jersey and Guernsey, are coming, more and more, to adopt them as resorts. The town of St. Helier has gone farthest in the direction of becoming culturally English, but there are comparatively few Englishmen who reside there permanently.

8: Landscape Succession in the British Isles

The earth's surface has evolved into its present condition as the result of many factors and forces. Study of rocks, topography, or climate, either alone or in combination, can not result in a satisfactory understanding of British landscapes. Man has been the latest and most potent factor in landscape evolution. His changes have not been accomplished in any one period of time. The British Isles have undergone a succession of changes in cultural landscapes to produce those we see at present.

Prehistoric man, early Mediterranean, Alpine Celt, Roman, Saxon, Dane, or modern Englishman proceeded to use the land he occupied in his own particular way and to change landscapes accordingly. Each may have done little more than slightly upset vegetational or animal distribution, erect a few stone monuments, or build straight roads to fortified towns, but he generally left some mark on the landscape. Geographers are interested in the activities of earlier occupants primarily to the degree that each modified the earth's surface. If it be found that a *place name* in use today is traceable to Celtic origin, or to some event involving an early Mediterranean, or that some house is oriented so as to face an old Roman road, a fact of geographical interest has been uncovered. Our excursion into so many fields of learning in the preceding chapter was taken primarily to establish background for the understanding of British landscapes that exist today. We shall turn now to some of the more recent events and changes in landscape succession.

We have seen why Elder England developed east of the Cretaceous escarpment and why London was destined to become its leading city. We shall now examine some of the many reasons why Elder England, with the exception of London and its immediate surroundings, is today a region with much less dense population and fewer cities than territory to the west of the Cretaceous beyond the frontier of the English culture hearth.

LONDON

Linn-dun (fortified hill above a lagoon) was a local point, even in Celtic times. Here the Romans had a ferry, and later a wooden bridge, to connect

London Road from Dover and Canterbury with Watling Street, with its branches leading west to Chester on the frontier of Wales, to Lincoln and York in the north, and to Colchester and other settlements lying northeast. A second bridge was built two miles upstream at Westminster. St. Pauls and Tower hills were fortified to protect so important a site.

Population increased during the Middle Ages to the point where London became officially recognized as a city. It was enclosed by a wall, whose gates have given names to many of the city's existing streets. The old walled town is still the "City of London," though it contains but a small fraction of the County of London, or Greater London, the city as we generally think of it. By the thirteenth century London Bridge was an imposing structure built of stone, and several wooden bridges crossed the Thames nearby.

The great trading companies that were organized in the fifteenth and subsequent centuries not only laid the foundation for British merchant shipping, navy, and Empire, but also established London as the home office for foreign commerce. By the end of the eighteenth century the city dominated all English trade and had become the world's chief money market. Only to London could a master bring his ship laden with any cargo whatever and be certain that he could sell it for cash. Goods originating in China, the East Indies, or the Americas and destined for Frankfurt, Paris, or Copenhagen were more than likely to be landed at London, from whence they were transhipped. This *entrepôt*, or transfer trade, demanded much in the way of wharfage, warehouse facilities, and commercial organization. It contributed greatly to the establishment of London as the world's busiest seaport and as the terminus of the most active ferry system on earth, to points across the North Sea. Ports on the continent prospered much in order of their proximity to London. Absence of excessive tides and winter ice were advantages denied several other harbors that might have threatened London's supremacy. The Port of London grew down the Thames for 20 miles and built wharves that could accommodate a line of ships 44 miles long, each prow flush with the stern of

the ship ahead. So busy was this commercial metropolis that tunnels were dug under the Thames in 1843 and 1870. Subway service was initiated in 1890.

The growth of London expanded the suburbs, but tended to empty the "City." While Greater London increased its population from 2.68 to 8.20 million between 1851 and 1931, the City decreased in permanent residents, from 129 to 13 thousand. With its "outer ring" of suburbs, Greater London attained a radius of 13 miles and an area of 585 square miles. About one fifth of the entire population of England has been living within this area in recent years.

Though notable population increase has been in progress for some three hundred years, the pace of expansion has accelerated notably during the last century. It was not until about 1800 that the population reached the million mark, and in 1861 it was considerably less than 3 million. It is possibly in excess of 8.4 million today, but many additional commuters come from beyond the chalk rims of London Basin to perform daily tasks within the limits of the *conurbation*, so that a very large part of southeastern England has functionally become part of London.

Southampton is a London outpost, where the largest passenger liners call. Dover, Folkestone, Harwich, and other centers supplement London's ferry service to the mainland. The southeastern coast, the "English Riviera," is mainly a playground for Londoners. Brighton, some fifty miles or one hour from the heart of the city, is often called London-by-the-Sea and Cowes, on the Isle of Wight, has become the world's greatest yachting center.

London has been compared with a living organism. Its "heart" is still the commercial and financial City. Unlike many other great conurbations, or huge urban knots of population, London has "lungs," and breathes relatively good air. These occur in the form of over 50 parks, with an aggregate size of 4,151 acres, or about 6.5 square miles. Houses extend over broad areas, rather than upward, in the vicinity of the business district. The average dwelling unit of Paris houses 34 persons, but in London only 8.

Manufacturing and industrial activities have always remained subordinate to financial, commercial, and political ones. Any city of over eight million people, however, requires many manufacturing establishments. Those of London are spread widely. Many are located in towns beyond the "outer ring" in London Basin. Each tends to specialize in some major activity.

The problems of feeding and taking care of such a huge population are extremely complicated.

Essex has become a great dairy farm. Garden vegetables pour in from all over southern England and the Channel Islands. The days have long passed, however, when the agricultural productivity of the British Isles could feed London and other English cities. Denmark must contribute large quantities of butter, bacon, and cheese. The Southern Hemisphere must supply meat, cereals, and fruit. In fact about every corner of the globe is depended upon as a source of something or other. Within the conurbation it is necessary to provide a distributing system to serve not only more than eight million, but under rather adverse conditions in many districts. It takes a high degree of organization, for example, to supply the things necessary for daily meals in the eastern end of the city where the poor districts are concentrated. Food must find its way to a population which in some areas has a density of over 200,000 per square mile. To many a cockney, the familiar landscape consists mainly of squalid, low houses strung along endless rows on narrow streets congested by foot and vehicular traffic, amid which are many small shops laden with cheap goods of all kinds, and near which are large warehouses and dingy manufacturing establishments. More commonly than his counterparts in other, similar urban landscapes, can he escape these drab surroundings by retreating to some nearby municipal park.

COMMERCIAL REVOLUTION

Though oldest British traditions hark back to the fertile soils and favorable climate of Elder England where the landowner rose to the position of conservative squire, the foundation of the nobility; and though London became the world's largest city, the most significant parts of England now lie elsewhere. The last few centuries have witnessed cultural revolutions that completely upset old values. The first of these was the Commercial Revolution, closely associated with the Voyages of Discovery. Others followed. Among their geographical effects is the fact that, except for London, the great population centers of England now lie in the West, across the oolite, beyond the frontier of Elizabeth's time.

The earliest penetration of the English into the West resulted from increasing land values in Elder England. Sheep were being crowded off lands that could be tilled profitably. Livestock were fed in the vicinity of London only if demanded by local markets. The chalk hills turned from wool to mutton. Sheep for wool or cattle for hides had to

be grazed in more remote places along the slopes of the Pennines in Durham north of Yorkshire, or even in the Cheviots.

The east-coast ports of Elder England had flourished commercially when a surplus of wool found its way to Belgium, Italy, or other places where people knew how to spin and weave. Textile manufacturing at home started late and slowly. When it did, waters of Pennine streams were a ready source of power for turning wheels; being soft, they were excellent for washing wool and as a diluting agent for dyes. East-coast ports withered commercially after the English began to make their own cloth.

In the fifteenth century, Great Britain stood on the outer fringe of the European World. It had some significance as a producer of surplus raw materials, such as tin, lead, wool, and wheat, but the great centers of cultural enlightenment, artistic ability, commercial activity, and financial stability lay elsewhere, in Italy, Spain, France, and beyond the Mediterranean. Toward the end of that century came the earliest of the Voyages of Discovery, the opening of a sea route around Africa to the Orient, the realization that an important pair of continents lay to the west, and the start of the Commercial Revolution. In the end it was found that England occupied the world's most central position. London is approximately the center of the land hemisphere, the half of the earth that contains about seven eighths of all land. Standing as a barrier between the North Atlantic and the

mainland of northwestern Europe, the British Isles were very favorably situated from the commercial standpoint. Ships could well land, for it was tedious and awkward to sail around.

When sea-borne trade started with places beyond the confines of Europe, London was the only city available as a British base. Plymouth and other Devon ports soon arose as competitors because they spared ships a long (Plymouth to London, 315 miles by sea) and somewhat dangerous voyage. Fowey, in Cornwall, the main southwestern port of Queen Elizabeth's time, from whence tin had long been exported, was too far removed from the population of Elder England, but the Devon ports had comparatively easy overland connections. Somewhat to the north, near the head of Bristol Channel, was another site with many advantages. Lying far closer to theoolite, it was more accessible to Elder England. Here rose Bristol, rival of both London and the Devon ports.

Valleys led directly toward London Basin from Bristol and air-line distance to the City was but a trifle over 100 miles. Bristol ranked second to London as a port as early as the fourteenth century. It was beyond Elder England, but not by far. In pre-Columbian days it was an important fishing center with fleets that ventured far across the North Atlantic, probably to the coast of North America. If Bristol fishermen knew of the existence of the western continent, they kept it a secret. Keeping secrets had long been common among fishermen. He who bragged lost his all. Knowledge of locations of productive fishing banks



Land and water hemispheres

was closely guarded, and the richest banks of all lay along the American coast. Columbus is known to have made voyages with Bristol fishermen and there is considerable speculation about the possibility that his "discovery" voyage of 1492 was not his first visit to America. It was from Bristol that another Italian, Giovanni Caboto, "Expert admiral of the fleet of all England," sailed in 1497 on a voyage of discovery in high latitudes, as well as his son, Sebastiano, in later years, in the service of Henry VII.

Bristol enjoyed a practical monopoly on the West Indian sugar-rum-tobacco trade of the seventeenth century. In payment for these American commodities went crude cloth to west Africa to be traded for slaves which were transported to the West Indies and American mainland.

The importance of Bristol declined rapidly when steamships began to supplant sailing vessels as commercial carriers. It is ironical that Bristol in 1838 was the port from whence the first steamer departed to cross the Atlantic. Its harbor was soon found to be inadequate for the larger ships that followed. West Indian trade gravitated to Liverpool, Glasgow, and other ports with deeper water in their harbors. Glasgow passed Bristol in tobacco import in 1760.

Cotton from the Levant first reached London toward the end of the sixteenth century. From there it underwent a long and expensive journey to the margins of the Pennines, where people were learning how to spin thread or yarn and to weave cloth. Britain's textile industry, based on wool and water, was then in its infancy. When it developed more fully, Liverpool was much closer than London for service as import or export center.

Liverpool was nothing more than a small fishing center toward the end of the twelfth century and its inhabitants were mainly non-English. It developed trade with Ireland, however, and grew to a population of about a thousand by the end of the sixteenth century. In the early seventeenth century, sugar, rum, tobacco, and cotton began reaching its wharves. A sugar refinery was established in 1668. Immigrants from Ireland and Scotland began arriving to make livings out of its increasing commerce. Population increased from 5,000 in 1700 to 35,000 in 1775. An active contraband trade was established with Spanish colonies which found illicit trading with the English far more profitable than legalized trading with Spain. During the eighteenth century, Liverpool became the leading center for slave trade. Over 300,000 Negroes crossed the Atlantic in ships of Liverpool registry between 1783 and 1793. Liverpool became wealthy and displaced Bristol as second port in England during the middle of the

eighteenth century. Slave trade widened the gap. When the Cunard liner *Britannia* started 14-day service to New York, Liverpool was its British terminus. Eventually this port was destined to handle one fifth of all English imports, one third of all exports, to own one third of all tonnage, and to handle three quarters of the American cotton trade. Its wharfage grew to a length of 77 miles.

The Commercial Revolution started when Europeans awakened to the possibility of handling their own foreign trade. An era of crude plundering and exploitation of foreign territories gradually developed into well-organized commerce. The Portuguese and Spanish gained important positions in the earlier parts of this evolution, but the English came to dominate in the end. The Devon ports, Plymouth, Bristol, and Liverpool arose beyond the limits of Elder England to threaten the commercial leadership of London. Elder England began to devote most of its energy to the serving of London. Merchant and financier became more opulent than the old landed aristocracy and demanded greater political recognition. Conservative Elder England began losing ground relative to the uncultured West. New products and new prosperity called for larger population. Immigrants were welcome and came from Ireland, Scotland, and the Continent. Many of these brought new skills that were to become the basis of another cultural revolution, along industrial lines.

INDUSTRIAL REVOLUTION

The first manufactured exports of England were chiefly textiles. Primitive industrial villages sprang up along the lower slopes of the Pennines where water wheels could be built and operated. People gradually developed skill not only in producing thread and cloth but also in mechanical invention. The flying shuttle, spinning jenny, and spinning mule came to replace hand methods and greatly increased the speed while reducing costs of manufacture.

Cotton was the cheapest and in many ways most useful fiber for fabrics. The west side of the Pennines was found to possess many advantages for cotton-cloth manufacture. It was accessible to Liverpool. Moist air kept cotton threads from snapping during manufacturing processes. Lancashire rose to supremacy in cotton manufacturing, while West Riding and other districts to the east of the mountains specialized in woollens.

The English gradually developed skill in making

things of iron. The forests of the Weald were found less advantageous as sources for fuel than those toward Midland Gap and along the eastern side of the Pennines. Smithies were busy around primitive forges in the Forest of Arden, near what is now Birmingham, for a century or so before 1600. Men around Northampton, a bit to the east, learned that local trees yielded useful tanbark, which could be used in tanning a surplus of hides, giving rise to a primitive leather industry. These early beginnings of the Industrial Revolution had a pronounced effect on British landscapes. Deforestation soon appeared at a rate elsewhere unequalled in Europe. England today is covered by forest to only 4 per cent of its area, which is extremely low for a nation in northwestern Europe. Even highly industrialized Belgium, with denser population, is about 12 per cent forested. As British trees disappeared, industry turned to coal and gained momentum.

The Romans noted "stony balls" being burned by early Britons, but general use of coal came only after many centuries. Lumps of "sea coal" were gathered along the shores of northeastern England as early as the thirteenth century and exported to London and Baltic ports for use in domestic heating. Many regarded them as a poor substitute for

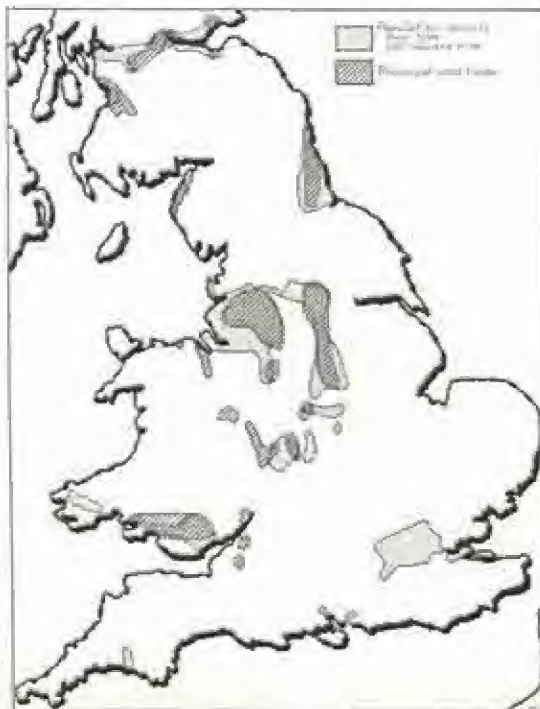
charcoal. By 1600 some coal found its way to crude blast furnaces. Newcastle was the chief source of this relatively unimportant product. Collecting turned to mining when it was realized that rocks in the vicinity could produce a more dependable supply. Coal resources were found to be so abundant that any notion of "sending coal to Newcastle" became a standard of absurdity still in general use among English-speaking peoples. Widespread industrial use, however, awaited an early eighteenth century discovery, the process of making coke.

High degrees of heat had long been obtainable from charcoal manufactured by the slow distillation of volatile products from wood heated under conditions where little oxygen was present in order to prevent combustion. An equivalent product, coke, could be manufactured by a similar process from coal, and it yielded even higher temperatures, so that it was found to be much better fuel for such purposes as making steel.

During the eighteenth century, coal was being mined near Birmingham, where a bed 30 feet thick, the "ten yard seam," was found, and also in southern Wales, at Merthyr Tydfil (a local Martyr). Most Welsh coal was exported from Cardiff, on the Severn Estuary.

In the course of time it was found that Great Britain is endowed with one of the richest coal reserves in Europe. Seams underlie something on the order of one eighth of England and Wales and one twentieth of Scotland. In England the main deposits flank both sides of the Pennines, where today no two adjacent fields are as much as 50 miles apart. Various seams, one above another, are beds in strata underlying the oolite. They occur at increasing depths eastward under London Basin, the North Sea, and elsewhere; also westward under the Irish Sea. Coal that once existed in rocks above the anticlinal crest of the Pennines has long since been lost to erosion. Coal formations that pass below the North Sea reappear at the surface in northern France and extend across Europe into the Soviet Union.

The importance of Britain's richest geological endowment was not realized until after the invention of the steam engine during the latter part of the eighteenth century. In general, the places that started local industries around water wheels or on the basis of fuel from nearby forests turned out to be near coal deposits. In the main, they were in places that had seemed poorly endowed by nature during the days of Elder England. The scale of values changed. Factors that had made southeastern England great, good soil and less rainfall, were no longer of primary importance in an industrial age. The phenomenal growth of



England: coal fields and population density

English cities in the nineteenth century occurred where soils were poor, wetness excessive, but coal present. England led the world in coal production until about 1900 and in iron and steel manufacturing until about 1890, after which leadership, in both cases, passed to the United States.

Lancashire was the cradle of the Industrial Revolution. The start was made before the days of coal and emphasis lay in manufacturing textiles out of American cotton. The region continued prosperous after steam-engine power was developed from coal because the western flank of the Pennines provided the new fuel in abundance, but industry also spread rapidly to other centers of coal supply; mainly along a line extending from southeastern Wales, with interruptions, through Midland Gap, and along the eastern border of the mountain backbone to Newcastle. Up the west coast of Lancashire it reached northward to Cumberland. The new cities became the leading centers of England's industrial activity. Their main growth came at about the same time that American cities grew large, starting in the nineteenth century, so they are equally lacking in medieval monuments.

AGRICULTURAL REVOLUTION

The Industrial Revolution was accompanied by a more or less complementary Agricultural Revolution. Population was attracted by the steady wages of industry and by the advantages of city life. The financial risks of farming and the many inconveniences of rural areas suffered in comparison. The growth of large cities drained population from the country. But other things had happened too. The machine drill had been invented to supplant the planting of cereal crops by hand. The value of artificial fertilizers had become known, and practices of crop rotation were making the land more productive. Fewer people were needed on the farms. A surplus of industrial products could be sold abroad and only a portion of the return would be necessary to provide food. Shipping had developed to a point where large food imports could be made.

England had not only fed itself since earliest times, but during the rise of Elder England had an agricultural surplus for export to the Continent. As late as 1840 it supplied 90 per cent of its needs for wheat, a figure that later dropped to 15 per cent. During the Industrial and Agricultural revolutions the whole pattern of English life changed. Life became urban. English coal and manufactures were sent to the ends of the earth. Though population grew rapidly, the amount of land in crops dropped, not only relatively, but actually. Even so recently as during the interval

1923-1931, the extent of plowed land declined from 15.7 to 13.8 million acres.

New agricultural practices resulted in a shift in emphasis from small, individually owned and worked farms to large estates. Mechanization is efficient and leads to the lowest costs for food. It is not practicable, however, on properties of a size that a single family can work by hand. The adoption of newer farming methods, starting during the late eighteenth century, tended to crowd the small proprietor out of existence. Properties increased in size, so that today nearly 90 per cent of Great Britain is in the hands of large owners.

Some 2,250 people own one half of the cultivated land in England and Wales, and 600 own 80 per cent of Scotland. Demagogues make political capital out of such facts, usually presenting them as matters they will be capable of reforming, but they are a natural by-product of the Agricultural Revolution. European World farmers are rapidly ceasing to be small, resident peasants. France has clung rather tenaciously to the older system, but the English have broken quite completely. The English farmer is likely to be a business man, resident in London, who employs a staff of highly trained managers in direct contact with hired laborers. The most specialized farming of all occurs in the Soviet Union, where the land belongs to the state and practically every phase of agricultural procedure is undertaken by persons trained specially for the task.

THE INDUSTRIAL WEST

There are enormous cultural contrasts between the Englishmen of Elder England and those of the West. Southeastern England maintains a strong agricultural tradition, that of the landed gentry. The importance of the squire is deeply ingrained. Conservatism of the traditional land-owning class is similar to that of the commercial and financial interests of London. Far different are the ideas and interests of peoples in the West, who are culturally the products of industrialism. One staunchly supports about every form of *status quo*, Empire, protective tariffs, and subsidies while the other is politically liberal. Most industrial interests would stimulate trade by removing tariff and preference barriers. A manufacturer ordinarily cares little whether profits be made inside or outside of the British affiliation of nations and colonies. Such economic and social contrasts are not without geographical significance. The parks of London have few western equivalents. The mill owner cared little about living conditions for his laborers,

nor about their physical or cultural well-being, other than their ability to work and produce. If death rates were high, other laborers could be recruited. The western cities developed shabby, grimy, congested worker's districts, where most people had to live. The luxurious spaciousness of London seemed wasteful to the "practical" mind of the industrialist. Even such a large city as Birmingham waited until 1900 before starting its first institution of higher learning. It took the form of a technological school.

Lancashire has grown into a population knot of some five million and one of the most congested industrial districts on earth. Though split into many individual towns and cities, buildings are practically continuous for ten miles in any direction from the center of Manchester. There is very little open country toward Liverpool.

Lancashire started a minuscule woollens industry in the fourteenth century based on imports from Ireland. Cotton was introduced in 1641 and by 1770 was being spun in greater volume than wool. Today over 90 per cent of all British cotton

spindles are within 50 miles of the center of Manchester and over 80 per cent are within a radius of 18 miles. Practically none occurs within the city itself, where rents and land values are too high. Here is the nerve center of the industry. Only offices, wholesale houses, distributors and makers of machinery, warehouses, and other interests requiring central location can afford the luxury of space in the heart of the conurbation. The mills have been pushed out to Oldham, Bolton, Bury, Rochdale, and even far to the north to Preston and Blackburn.

Dependence on water power had originally located textile plants inland, toward Pennines slopes, rather than at the port of Liverpool. There they tended to remain, in spite of such poor transportation facilities that bales of cotton reaching Liverpool 21 days after leaving American ports commonly spent an additional 40 days in making the 40-mile trip to Manchester. To overcome such delay and the expense it involved, one of the world's first main railroads was built in 1830 between those cities.

Though it offered many advantages commercially, the coast around Liverpool suffers from one

important physical handicap, extraordinarily high tides. Water rises and falls some 26 feet twice each day, and at some places as much as 50 or 60 feet. This difficulty was to some extent alleviated by building floating docks, so that ships could rise and fall with them during tidal changes, but Manchester demanded a port of its own. In 1894 the Mersey Ship Canal was opened, with a channel 120 feet wide and nearly 28 feet deep. The drop of 60 feet from Manchester was overcome by five locks. Manchester created an artificial harbor and became a seaport. With its suburb, Salford, its population grew to about one million.



British Isles: manufacturing centers

Industrialization has proceeded northward along the coastal lands west of the Pennines. The coast of western Cumberland, to the west of the Lake District, supplies coal to many centers. At Maryport, mines have been run out as far as four miles beneath the waters of Solway Firth. Lead mined in the hills near Keswick gave rise to a pencil industry that later came to depend on graphite from Ceylon and cedar from Florida. Rainfall is so excessive that only about 2 per cent of the territory nearby is under cultivation, mainly in oats and potatoes. Cattle raising and dairying are typical rural occupations, in open territories between industrial towns.

Black Country Second in rank among the industrial districts of England is the Black Country, just south of the Pennines and about equidistant from Lancashire, London, and Bristol, with easy communications to each. Here is Birmingham, a typical product of the Industrial Revolution. Its earliest church dates only from 1285 and as a town it had very little consequence until the sixteenth century. The presence of some local iron ore and nearby forests led to a small iron industry. Horseshoes, nails, and chains were leading products. As manufacturing increased so did the pall of smoke that constantly filled the air. People began calling the district, Black Country, or Black Belt. By the seventeenth century the ironmongers had become expert enough to be making such things as swords, iron bars, rings, toys, and buttons. Industry turned to coal in the eighteenth century, and skilled artisans began manufacturing excellent knives and such complicated wares as padlocks. Toward the end of the century they were making steam engines, lanterns, lamps, and even turning to new metals, such as brass. Local iron and coal supplies dwindled, but the presence of skilled workers warranted imports of raw materials if sufficiently high-priced products could be turned out. Activities had to become more and more concentrated on expensive ware. Today, with a population in excess of one million, Birmingham supplies pins, needles, fishhooks, screws, bells, steel furniture, buttons, coins, and a great variety of brass and precious-metal products. Its heavier industries include glass and chemicals. The twentieth century has seen its workers turn to making automobiles, electrical goods, office machines, and rubber goods. Though it became the center of a great canal system in the eighteenth century, Birmingham has suffered from inland location. Transportation costs have been high. This favored particular concentration on wares so high-priced that hauling costs amount to only a minor fraction of the ultimate price to consumers.

The industrial history of Coventry, about fifteen miles southeast, resembles that of Birmingham, except for the fact that it started as a center for making woollens. Early in the eighteenth century it received a considerable number of Protestant French immigrants, who brought the skills of ribbon and watch making. Textile activities were ultimately eclipsed by metal industries. Coventry came to produce such varied products as bicycles, automobiles, sewing machines, radios, and plastics. It was there that Daimler made his first automobile in 1896 in direct consequence of bicycle manufacturing since 1875. The population increased threefold to more than 200,000 between 1880 and 1931. So important was Coventry, particularly as a center of automobile manufacture, that the Germans singled it out for especially heavy attack by air, early in the raiding of England during World War II.

Coal extends north from the Black Country along eastern margins of the Pennines as far as West Riding. Many industrial towns follow the outcrops.

West Riding Sheffield has the advantages of local iron ore, excellent rock for use as grindstones, pure water for tempering steel, and swift streams to power bellows and turn small grinding and polishing wheels. It early attained a reputation for fine cutlery. Though local iron resources proved far from sufficient to meet demands, the presence of skilled artisans permitted the manufacture of expensive wares, for which iron could be imported, even from Sweden and other distant places. With only 4 per cent of all blast furnaces, Sheffield turns out 14 per cent of all British steel, much of it in such finished products as railway wheels, axles, armor plate, guns, knives, files, scissors, and machinery.

Leeds, farther north, retains its original textile interests, specializing in woollens. Wool, imported mainly through Liverpool and exported both through that port to non-European and through Hull to European destinations, is the main base upon which it and many other West Riding communities rest economically. In most textile cities, however, there is a great deal of industrial diversification. Men work in machine shops and other heavy industries, while women and children tend the machines that spin or weave.

Together, Sheffield, Leeds, Bradford, and other West Riding communities form what is essentially a great conurbation of two million, in which the population density averages over 5,000 per square mile. All West Riding cities are gloomy

and poorly planned products of an industrial age.

Between the Black Country and West Riding are many smaller industrial centers, less spectacular cogs in the wheels of British industry, with smaller populations than the giants at either end of the belt. Derby is famous for its excellent porcelain wares. Leicester turned from the manufacture of ordinary woolen cloth to such specialties as stockings, lace, elastics, and shoes. Stafford and Northampton are important shoe manufacturing centers, a heritage from older days when cattle and tanbark were locally abundant. Nottingham turns Manchester-produced thread into cotton products of high value, such as stockings, lace, and curtains. Hops grown along the valley of the Trent and water containing gypsum have established Burton as a brewing center.

Newcastle lies about as far north of the West Riding industrial center as the latter lies north of the Black Country. It has exported coal ever since sending the first "sea coal" to London, in the fourteenth century. Even in recent years coal has formed over half of the value and 95 per cent of the weight of its exports. Colliers shouldn't return empty. Return cargoes are desirable and bulky ones are most suitable. For these reasons Newcastle and other ports along the Tyne have established a chemical industry based on such bulky and cheap materials as chalk, salt, and pyrite. There is also considerable ship building and repairing. Some 800,000 people now live in the Tyneside district, less than 300,000 of whom reside in Newcastle itself.

Hull, on the Humber, is an east coast complement to Liverpool. It serves mainly as an importer of foods from across the North Sea but also as an outlet for wares manufactured in West Riding and other industrial centers east of the Pennines.

Many small fishing ports line the English shore of the North Sea. Of the 30,000 craft that normally ply those waters, about two thirds are British. The incomes of about a million people depend on them. Commercial fishing started in about 1400 when the Dutch learned to preserve herring. The English soon wrested the lead from the Dutch and now account for about half of the fish caught by Europeans. Grimsby, the world's greatest fishing port, sends out as many as 300 cars of fish per day on special trains to London, Birmingham, Manchester, Liverpool, and even Scotland.

Ports toward the Thames serve not only as east-coast resorts but as harbors for small continental steamers. Dover enjoys the advantage of shortest passage to the mainland.

South-coast ports serve both resort and Lon-

don outport functions. Portsmouth and Plymouth are the only ones that have attained populations in excess of 200,000.

WALES AND CORNWALL

Wales was mainly a land of poverty and sheep for many centuries. During the sixteenth century it began to export small amounts of lead, copper, and silver, but its greatest mineral resource had to await development during the Industrial Revolution. Coal occurs near the south coast, in a belt some 75 miles long and from 12 to 15 in width. That toward the east is bituminous, and serves excellently for both industrial and domestic purposes. Westward the coal is harder, eventually becoming anthracite. The harder varieties burn with very little smoke and leave but little ash, so that they are highly prized the world over for both domestic heating and use on ships. "Welsh steam coal" is in demand in ports everywhere, although strong competition has arisen in recent years from preference for oil burners and diesel-powered ships.

Swansea, toward the west, developed as a great smelting center for Spanish iron ore, copper from Spain and elsewhere, and tin from Straits Settlements, Nigeria, and Bolivia. Fumes have killed trees for many miles around. Llanelly and Port Talbot, conveniently located on estuaries near mines, became the great coal export centers. Since 1889 they have been supplemented by Barry Dock. Cardiff, with 80 per cent of its exports being coal, developed industrially. Its population grew from 2,000 in 1801 to 224,000 in 1951. English Newport, not far away, jumped from 1,000 to 89,000 during the same interval and for similar reasons.

Numerous resort towns along the northern and western coasts of Wales serve as playgrounds for Lancashire and other English centers. Bangor, in the northwest, is Great Britain's finest source of slate. The barren interior of Wales now furnishes domestic water to Liverpool and Birmingham. Sheep raising has become more profitable in recent years, so that sheep density has increased to about one per acre in some central counties. Cattle are numerous to the east, and the eastern border of the country produces apples, berries, and other fruits for English markets.

Cornwall, the southwestern point of England, resembles Wales in many ways, but it is less rugged. It has supplied tin since the Bronze Age, but the low price of imported tin rendered almost all mining unprofitable during recent years. The Colcoath Mine is famous for its great depth, 2,100 feet, and also because its workings extend under

the sea at such short distances below bottom that the rumblings of waves may be heard in them.

Summers are so cool in Cornwall that field agriculture ascends only to the 1,200-foot contour, but winters are only slightly colder and the absence of frost permits cultivation of winter roses for London markets, early potatoes, cauliflower, strawberries, and many garden flowers. Cornish pastures provide a surplus of butter, cheese, milk, and geese. Some clay is mined for making china, but a general lack of resources handicaps Cornwall in an industrial age. It is gradually losing population, in spite of the fact that the picturesque villages along the coast attract many resorters and summer visitors:

SCOTLAND

The impact of the Industrial Revolution was felt with about the same force in Scotland as in England, as is shown by the fact that the population is now over 77 per cent urban as compared with England's 80 per cent. The Highlands, with 60 per cent of the area, have but 10 per cent of the population, and the Highlands plus the islands, with 70 per cent of the area, have little more than one fifth of the population of the country as a whole. The main results of the Industrial Revolution are to be seen in the Midlands.

Edinburgh, like London, started primarily as an agricultural nucleus. Founded by an Anglo-Saxon king and nurtured by Germanic peoples, it was the stronghold from whence foreign language and culture reached the original Celtic population. The Celtic frontier was pushed gradually into remote parts of the Highlands and isolated islands. Edinburgh became the educational, financial, and political focus of Elder Scotland. Though local coal deposits exist, the industrialization of Edinburgh has not proceeded far in the direction of heavy industries. The main manufactures are those required of a capital and educational center, consisting mainly of goods demanded by urban people plus paper, books, ink, and small machines. From a population of 38,000 in 1801, the city grew to 475,000 in 1941. Leith, slightly over two miles away, long served as the chief port for Edinburgh and eventually became incorporated within the city. Granton, Portbello, and Musselburgh are nearby ports and resorts on the firth. Communications northward to such places as Perth, Dundee, and Aberdeen have been relatively direct since the construction of the Forth Bridge in 1890, about ten miles west of Leith.

Glasgow resembles the cities of western England in being a product of the Industrial Revolution. It started on fertile volcanic soils as an

agricultural center, but its hugeness does not depend on that fact at all. From a population of 13,000 in 1707, when the Scotch and English Parliaments were united, the city grew to nearly 350,000 within a century, and more recently to over 1.1 million, or second rank in the British Isles. Lanarkshire contains over 1.5 million, the average population density being 1,790 per square mile.

The Commercial Revolution arrived rather late in Glasgow. The Devon ports, Bristol and Liverpool, had prospered for many years before the Scots took an active part in West Indian trade. Cheap labor, capable of weaving coarse textiles good enough to be sent to Africa, gave Glasgow textile mills their start and provided an economic advantage over the English. Lower customs duties stimulated a lively smuggling trade across the border to England. Sugar, rum, and tobacco were imported in increasing amounts, so that by 1775, Glasgow was receiving over half of the tobacco arriving at European ports. As the city grew, its streets began to bear such names as India, Jamaica, and Havana. The Clyde was deepened so that ships could come upstream from the original outport, which was some eighteen miles away. Eventually the channel could accommodate ships drawing 35 feet, at high tide. Wharfage now exceeds two and one-half miles and Glasgow ranks sixth among ports in the United Kingdom.

About two thirds of all Scottish coal is concentrated in the Ayrshire and Lanarkshire fields near Glasgow, but it was not used in any considerable amount until long after Manchester, Birmingham, and other English cities had developed world-wide manufacturing fame. Local iron ore of the "black band" variety was not as readily smelted as the red hematite ores in England. It was only during the middle of the nineteenth century that methods of using the Scottish ore were perfected and heavy industries could be established in Glasgow. These now dominate the city. Glasgow builds ships, bridges, locomotives, pipes, and heavy machinery. Most of the iron ore is now imported from Spain.

Glasgow's late start in shipbuilding turned out to give the city a competitive advantage over English ports that had long held leadership. It came just when the change from wood to iron was beginning so that Glasgow started with iron ships. English yards long fought a losing battle in attempting to stick to wood. The greatest ships as yet constructed, the *Queens Mary* and *Elizabeth*, were built on the banks of the Clyde.

Tobacco and cotton manufacturing and sugar

refining remain as heritages of earlier days. Pottery making and many other industries are established in Glasgow. The whole urban landscape is like that of the worst industrial cities of England. Grime and soot are everywhere. Snow is blackened an hour or so after falling. The sun manages to penetrate the canopy of cloud and smoke over Glasgow to shine only about 40 per cent of all possible hours. El Paso, Texas, enjoys sunshine 80 per cent of the time the sun is above the horizon.

Trade products flow westward across both England and Scotland, especially the latter. Leith and other ports on the eastern side of the country import huge quantities of food, as do their English equivalents from Tyneside south. Most of the exports leave from the west, especially from the vicinity of Glasgow, as they leave from Liverpool, Cardiff, and Bristol.

Though the largest increases in population have been urban and particularly concentrated in Lanarkshire, rural population has grown during the last century both in the lowlands and highlands. Many of the smaller towns have increased notably. Farming has been intensified. Lowland rural landscapes are rather English in pattern; irregular hedgerows outline fields that grow wheat, oats, barley, turnips, potatoes, and clover. Fields stop at an elevation of about 1,250 feet. Above them are extensive pastures where sheep graze, to provide wool for Scottish and English mills, or eventually to be driven to lowlands where they are fattened on turnips and sold as mutton. Aberdeen and other east-coast ports are important fishing centers. Some 40,000 of the 130,000 people who regularly fish in the North Sea are Scots. There is some export of building stone from the ancient rocks of the eastern end of the Highlands.

Natural landscapes have undergone very little change in the Northwestern Highlands. Only 2 per cent of Sutherland, in the extreme north, is arable land. *Crofters*, or small tenants, live near coasts, where meager earnings from farming can be supplemented by those from fishing. Home industries, spinning and weaving, add to family incomes. Some tourist trade appears in summer. Large tracts of land are reserved for grouse and deer shooting. Whisky distilling is an important industry in small villages, especially along the west coast north of the Firth of Clyde. Peat smoke is used to produce the distinctive flavor of Scotch whisky, most of which is sold to blenders and exporters in Glasgow. As in wetter and less prosperous parts of Ireland, peat is the fuel of many rural inhabitants.

IRELAND

The Commercial and Industrial revolutions had relatively little impact on Ireland and that little was mainly in the extreme northeast. The Emerald Isle had seen too many disasters.

With Great Britain, Ireland suffered severely from the Black Death of the fourteenth century. Population figures are not available for Ireland, but in Britain about half of the population was wiped out leaving only about 2.5 million. The population increased to 5 million by 1700, to nearly 9 million by 1800, and to about 46.5 million by 1942. In Ireland the population was about 1 million in 1672 and 8.5 million in 1846. Ireland then contained about one third as many people as the United Kingdom, on the island of Great Britain. The Irish famine in 1846 caused so many deaths that emigration assumed panic aspects. So many died, or left, that the population in 1850 was but 4 million, or less than half that of 1846. About 90 per cent of the Irish emigrants went to the United States, where today the population of Irish extraction is over four times that of Ireland itself. The population remained about 4 million for more than half a century, until 1911, when it began to climb. At present it is about 4.3 million, divided so that about 1.3 million live in Northern Ireland, which is politically part of the United Kingdom, and 3 million in independent Eire. Ireland thus has less population than in 1700 and little more than half of what it had in 1800. This is certainly not the pattern associated with the Industrial Revolution.

The contrast between Ireland and England is further brought out by a comparison of percentages of urban populations. England was 20 per cent urban in 1770, 50 per cent in 1850, and is over 80 per cent today. Ireland was 20 per cent urban in 1800 and is 50 per cent today. This is a very low proportion for a country in northwestern Europe.

Landscape changes have been far less radical in Ireland than in most other parts of Europe during the last century. Great urban landscapes such as are implied by such population densities as nearly 15,000 per square mile in London, 18,000 in Manchester, and 20,000 in Liverpool have only mild equivalents in Ireland. In rural areas the main changes have accompanied reduced acreage under cultivation and increased acreage in grazing. Cattle have increased in numbers while hedgerows around old fields have passed slowly into decay. Pasturage increased 66 per cent between 1859 and 1900, while wheat production declined 90 per cent, barley dropped 60 per cent, and flax 43 per cent.

The division of Ireland into two political units is essentially an expression of religious contrast. Some two thirds of the people in Northern Ireland are Protestants, while three quarters of those in Eire are Roman Catholics. The boundary between the two states is unsatisfactory to the English and Northern Irish because Northern Ireland does not include all of the old Province of Ulster, and it is unsatisfactory to the people of Eire because it includes two counties, Fermanagh and Tyrone, with Roman Catholic majorities, and two others, Londonderry and Armagh, only slightly over 50 per cent Protestant.

Though Ireland has for centuries been colonized by foreigners, immigration was most active in the sixteenth and seventeenth centuries because of hard times in Great Britain. Scots and Englishmen arrived in such great numbers that in two counties of Ulster, Down and Antrim, they outnumbered the Irish more than two to one. With them came the Protestant religion that dominates today. In general, the "Scotch-Irish" are not mixtures of Scots and Irishmen, but are the descendants of the Scots and English who emigrated to Northern Ireland.

The one sixth of Ireland contained in Northern Ireland is more densely populated than Eire, but most of the people are concentrated around Belfast, along the valley of Lagan, the sides of Lough Neagh, and the River Bann. Most of the people live in or close to Antrim, Ireland's northeastern county.

Beal feirste (ford of the sandbank), once occupied by Normans, was captured by the English in 1573. As Belfast, it today contains more than one third of the population of Northern Ireland and has the industrial functions of Glasgow.

Belfast, like London and Edinburgh, was first an agricultural nucleus. The surrounding region of volcanic soils had great fertility and, for Ireland, the rainfall was moderate. By the eighteenth century Ireland was growing a great deal of flax and most of it went to Belfast to be manufactured into linen cloth. Flax growing declined until it was almost restricted to Ulster, but the mills of Belfast continued to operate on imports from Belgium, Latvia, and elsewhere. Though farm products rank high among exports, mainly to Glasgow, Belfast's increase in population from 15,000 in 1800 to 448,000 in 1952 was chiefly the result of industrial activity. Like Glasgow its business center has tall brick buildings. Its 800,000 spindles are tended by some 60,000 persons, predominantly women and children, while men build ships and engage in other heavy industries. It was not until 1791 that Scots built Belfast's first ship. In 1844 the yards turned to iron, in spite of the fact

that both coal and iron had to be imported. Some 10 per cent of all British tonnage originates on the ways of Belfast. Foodstuffs bulk large among the imports of this industrial center.

Londonderry, or Derry, at the head of Lough Foyle on the north coast, is second among the cities of Northern Ireland. Many of the original settlers were English, who were attracted to the place when James I gave up Ulster. An old walled city has grown into a miniature Belfast with a population somewhat less than 50,000. Some ships are built, but textile manufactures are the principal activity. The main specialization is in shirts, which are cut in shops and sewn in the homes of some 40,000 rural women, a type of piecework that is by no means uncommon in Northwestern Europe.

Dubh-linn (black pool) was an old settlement near the mouth of Liffey River. As a Norse town of "Eastmen" it was hostile toward the Irish. During the thirteenth century many Bristol colonists arrived. At first the town functioned as a fortress and later became the nucleus of an English colony. Soils were fairly good and rainfall moderate, so the English Pale prospered agriculturally. During the eighteenth century it was Ireland's leading agricultural center. In 1822 the population of Dublin was 186,000, while that of Belfast was but 39,000. Dublin still maintained its lead in 1952, with a population of 506,000, but only by a small margin.

Dublin resembles London and Edinburgh not only in agricultural background but also in subsequent development. It is primarily a political, commercial, financial, educational, and cultural center, with such buildings as Parliament, the National Gallery, Trinity College, and headquarters for many commercial enterprises. Trade has been almost exclusively with Liverpool and other English ports. Goods destined to Ireland from foreign sources would be carried on larger ships to England and then on smaller ones to Dublin or some other Irish port. There is some considerable rise in non-British trade recently, so that Ireland maintains direct steamship lines to Spain, Belgium, and France, but 75 per cent of all imports and 90 per cent of all exports are still with Great Britain.

English and Scots came to Eire to own and control, rather than to colonize as rural peoples. From the Pale they extended their holdings so that by the end of the seventeenth century only one sixth of Ireland remained in Irish hands. The Irish toiled for landlords they were not likely to ever see. This sharp distinction between absentee

owner and tenant favored retention of local culture. Irish remained the universal language until the middle of the nineteenth century and is even now the mother tongue of about one fifth of the Irish.

Poverty has remained chronic in the Central Plain. It is estimated that a family can eke out a reasonable living on thirty acres of drained land in central Ireland, but two thirds of all farms are smaller than that and over half are smaller than 15 acres. Sixty per cent of Ireland is owned by fewer than 15,000 people. The Government has taken strenuous measures toward more equitable distribution of land and improvement of rural conditions. In spite of this, the acreage of plowed land has decreased and pasturage has increased, even within the last few years. When the fortunes of a peasant family improve sufficiently, it is likely to move to some city. Over much of agricultural Ireland population decrease is reflected by rise in the ratio of cattle to men. During less than a century the number of head of cattle per 1,000 rural inhabitants has increased from 225 to 1,123.

Excessive water is the greatest natural enemy of the Irish farmer. Ditches are filled with black water, stained by peat and other vegetational matter. Crops fail when the rainfall is more excessive than usual, mainly because harvesting is impossible. Potatoes decayed in the ground during the great famine of 1846, as they have done in other too-wet years. The low standard of living among people in a land with such handicaps is reflected by the fact that the average person in Great Britain uses 4 tons of coal per year, where in Eire the per capita consumption is but 26 pounds.

Landscapes in the uplands surrounding the Central Plain have not changed much in recent years. Over large districts the direction of change is toward that of natural landscapes, but here and there some cultural scar remains that may persist for many centuries, such as the ruins of an old stone house or signs of accelerated erosion along an abandoned trail. The excellent harbors along the west coast are useful only to a few fishermen. Here and there appears some landmark of modern times, such as the important airport at Foynes, or the cable landing on the Island of

Valentia. The beautiful Lakes of Killarney near the Mountains of Kerry, in the extreme southwest, attract many visitors.

Sligo, Clew, Galway, and Shannon coastal indentations provide four possible equivalents of Bristol along the west coast. Railroads from Dublin radiate to these four potential trade centers, but traffic over them is comparatively light. The ships that reach these harbors are ordinarily few in number and small in size. The immediate hinterland has little to offer. It is too cloudy and rainy to permit sufficient agriculture to feed a dense population and absence of industry and commerce precludes the importation of much food. Lack of forest and iron ore kept away primitive industry. A mediocre coal supply is uninviting to modern industrialization. The population of Galway, directly west of Dublin and an extremely convenient outlet for the Central Plain, is but 18,000. Limerick, to the south and at the head of the Shannon estuary, is the leading west-coast city with a population of about 43,000. Its agricultural manufactures, such as flour, bacon, butter, and condensed milk, are exported to Glasgow, England, and elsewhere. The rapids of the Shannon, below Killaloe, were harnessed in 1930 to provide Limerick and its surroundings with cheap hydroelectric power.

Cork, on the south coast, is the Irish equivalent of Bristol. Its population is about 76,000, engaged chiefly in agricultural processing and export trade. Butter, flour, and meat are sent to England. Tanneries, breweries, shipyards, and a Ford factory are evidences of modern industrialization. Cobh (Queenstown), the outpost, is a point of call for many transatlantic liners. Passengers and fast mail are there transferred to trains or planes bound for Dublin, Liverpool, or London. Waterford, farther east and therefore closer to Dublin, has an excellent harbor, some fair coal, and is making considerable commercial and industrial progress.

The lateness in appearance of the Industrial Revolution in Eire is shown by the fact that only about one fifth of the entire population is resident in all of the larger cities combined. Landscapes have changed much less during the last three centuries than elsewhere in the British Isles, or for that matter in Northwestern Europe generally.

Precipitation is excessive along the whole west coast of Norway. Bergen, somewhat protected and at sea level, has an annual average of 84 inches, distributed among 206 rainy and 38 snowy days. Parts of the west-facing slopes along the coast probably receive an annual precipitation of about 200 inches. Decrease is abrupt down the eastward slopes leading to the Gulf of Bothnia. At Stockholm the annual precipitation is but 22 inches spread out over 168 rainy and 58 snowy days in the average year. In some parts of eastern Sweden the annual precipitation is under 15 inches. Low temperature prevents such territory from having an arid climate.

The Northwestern Highlands of Europe attain greatest elevation in southwestern Norway. Mt. Galdhøpig rises above 8,000 feet and two dozen individual summits are higher than 7,200. Northeastward toward the international boundary there are some peaks above 6,000. In the main, however, the Scandinavian Peninsula is a tableland about 3,000 feet high toward the south and half that high toward the north. The plateau combines a gentle tilt northward with a rather steep slope eastward. This high plateau is the *vidda*. The surface is gently undulating, with occasional peaks rising above general levels. *Fjelds* of snow and ice cover quite large areas on the "drenched dome" of southwestern Norway. From them a number of glaciers extend short distances down individual valleys. Fewer ice masses survive the summers in the lower territory toward the north.

Physically the Scandinavian Peninsula has four main parts: barren highlands, rugged westward slopes, gentle eastward slopes, and southern and eastern plains.

Barren highlands resemble those of Scotland and northern Ireland in many ways. Their extremely ancient rocks bear only thin and scattering soils. Rainfall is excessive. Summers are cool. Much of their area lies above the cold timber line, and evidence of Ice Age erosion is fresh. Many rocks glisten when low-angle sunbeams are reflected from their ice-polished surfaces. Detailed inspection reveals the presence of many scratches, or *glacial striae*, formed by moving ice dragging hard rocks across the surface. On a larger scale are scooped-out basins, many of which contain lakes that are floored and surrounded by fresh bedrock. Steep-walled, ice-scoured valleys lead toward the sea, where their submerged, estuarine ends are called *fjords* (fjords). Viewing such scenery one is readily convinced that not so long ago this region resembled Greenland in being covered by a great cap of continental ice.

Glaciologists estimate that the ice actually reached a maximum thickness of about ten miles over what is now the Gulf of Bothnia.

Forests rise to about the elevation of 3,600 feet in southern and to 300 feet in northern Norway. Scraggly birch, aspen, and alders make patchy stands toward the upland tundra. The monotony of dark, wet tundra landscapes is broken here and there by the freshness of glaring white fjelds, even in late summer. It is also enlivened at times by myriads of small flowers, the presence of various berries, and by interesting growths of lichens that cling closely to many rocks.

Rugged westward slopes exhibit Norway's most magnificent scenery. Steep-walled glaciated valleys and fjords cut the highlands deeply. The longest fjords, Sogne and Hardanger, have lengths of more than 100 miles. Most walls rise sheerly, in some cases to more than 3,000 feet. They are also steep below water level, sometimes running down for several hundred feet. From isolated lowland flats at fjord heads, and here and there along their sides, it is difficult to climb to the *vidda*. Valleys leading to fjord heads are step-like, with rocky treads separated by abrupt risers. Lakes perch on many of the treads. The risers are sheer and hard to scale. Many valleys of the gently undulating *vidda* end sharply at fjord walls, where their end cross sections "hang" at elevations high above the water of the fjord. Streams that flow along these upland valleys plunge over into the fjords as high waterfalls or turbulent cascades with many falls along the way. Only in relatively few places are fjord-head lowlands connected by rail or highway with the uplands above. As seen on a map, the fjords exhibit many straight segments separated by sharp turns. The straight parts follow lines of weakness in the rocks. Running water cut valleys along many of these lines of weakness before the Ice Age began. During that period the stream valleys were deepened by ice scour and given the steep walls that we see today.

The waters in fjords are generally calm. They are deficient in life as a rule, because shallow *sills* near their mouths ordinarily separate them from the adjacent oceanic waters. The force of storm waves is broken by these shoals. Circulation into the fjords is so restricted that there is insufficient oxygen for most kinds of animal life below the upper few feet of water.

On maps the fjords appear to be magnificent harbors, but in actuality few have been utilized, and only a handful have developed busy seaports. As a rule each fjord serves only a tiny hinterland. The possible harbor site at its head serves only

the few people who inhabit a very restricted and isolated lowland. Many fiords are hard to enter because sills lie at slight depth. Not only are they likely to be winding and difficult to navigate but they also have a serious handicap in being covered by dense fog much of the time. Anchorage areas are restricted to muddy bottoms, and these are few, being located mainly close to fiord heads. Elsewhere anchors slide freely along the polished rock bottoms.

Some 150,000 islands lie along the coast of Norway. A few are high and large. The Lofotens attain an elevation of over 4,000 feet. Most islands, however, are small, low, ice-rounded rocks, with extremely irregular outlines. These little islands, *skerries*, protect extensive parts of the mainland from storm waves. Coastal steamers nearly everywhere manage to run along sheltered routes somewhat similar to the Inside Passage along the coasts of British Columbia and southern Alaska.

It has been estimated that the total length of the Norwegian shore line, including all islands, is half as long as the equator and that ten miles of shore exist for each square mile of land in the country as a whole.

Gentle eastward slopes extend broadly across Sweden toward the Gulf of Bothnia. Scenery is subdued in comparison with that of the narrow rugged westward slope belt of Norway. Many large rivers are fed by some 200 glaciers and various irregular fjelds as well as by highlands' precipitation. Most of these streams empty into the Gulf of Bothnia. In Scandinavia, as in England, main streams flow eastward.

The upper ends of Swedish streams are glaciated and picturesque. Steep-walled valleys lead to lakes that occur chiefly in a zone with an elevation between 900 and 1,400 feet. These water bodies lie above morainal dams which were formed during prolonged halting stages of the last ice retreat. The lakes are long and narrow. Torneträsk, a scenic gem in the north, has an area of 82 square miles. A few others are even larger. Stream flow is comparatively well regulated by lakes, so Swedish rivers are not subject to the severe floods that are experienced in so many other lands.

The slopes of Sweden are broadly covered by taiga forest. Trees are fairly large in the lowlands but diminish in size toward the tundra upland.

Southern and eastern plains extend as a wide belt across Denmark, southern Sweden, and along the lower slopes flanking the Gulf of Bothnia. The boundary between lowland and slopes is broad and transitional. It is usually considered as lying north of the principal lake district of southern Sweden.

Lakes such as Vänern (2,150 square miles), Vättern (730 square miles), and Mälaren (440 square miles) occupy glacially scoured, hard-rock basins. The lowlands along Oslo Fiord and the Glommen, or central valley, of southeastern Norway resemble the Swedish lake district, but southernmost Sweden is a land of younger rocks and reasonably good soils.

Skane (Skåne, pronounced sköne, Latinized as Scania, hence the English Scandinavia) is the small, southernmost tip of Sweden. Its rocks are similar to the chalk of England and France, but they are covered irregularly by glacial deposits. Here, in a region of moderate precipitation, is the best agricultural land of Sweden. Denmark, to the west, is similar.

CULTURE BACKGROUND

Scandinavia was known only by rumor to the ancient Greeks, while the Romans, somewhat vaguely, regarded it as a group of islands. This ignorance does not imply unimportance or lack of population. The culture world of the early Nordics was remote to Mediterranean peoples. It developed in ways that they would have regarded as crude and foreign. Not until the Barbarian invasions toward the end of Roman times were Mediterranean populations to come into direct contact with institutions that had evolved during many centuries of cultural development by peoples of the distant North.

Nordics inhabited the coasts of the Baltic since at least Stone Age times, possibly as early as 3000 B.C. By the time of the late Stone Age, languages and cultures had assumed a decidedly Teutonic stamp.

However remote the Nordics appeared to Mediterranean peoples, some trade existed between the two. Many Roman coins found their way to Sweden and Denmark.

By A.D. 500, Frisians, from the coast of the North Sea, had become active mariners and traders. Trade with the Baltic was opened, and this inland body of water for some centuries was commercially the Frisian Sea. Slavic-speaking people had driven early Germans westward across the plain. Frisian contacts were made with Germans at Lübeck. Swedes willing to engage in trade were centered at Birka, an early Middle Ages equivalent of Stockholm. Frisian supremacy eventually declined as Danes and Norwegians became increasingly menacing as pirates or capable as tradesmen.

"Preserve us, O God, from the rage of the

Norsemen" became a regular prayer in European churches during the Middle Ages, and not without cause. The first foreign excursions of Nordics were chiefly raids with the objective of plunder. It was not until after 850, when Harold the Fairhair became undisputed king of Norway, that serious thought was given to legitimate trade or to colonization. Many local chieftains and groups of followers who refused to recognize Harold's authority emigrated to the Orkneys, Shetlands, Hebrides, Iceland, Ireland, Scotland, northern France, and elsewhere. Between 878 and 1035 at least some part of England was dominated by Norsemen. These were Danes and Norwegians, not Swedes. The Sagas of the Vikings, the old literature of the Norsemen, relate adventures of these times of exploration, conquest, and emigration.

The name "Baltic" appears first in the writings of Adam of Bremen in the eleventh century. This shallowest and freshest arm of the North Sea

reaches inland for about 800 miles to the head of the Gulf of Bothnia. At its west lies a group of islands and the peninsula of Jutland. Here the Danes occupied a position somewhat similar to that of the Greeks in the Aegean.

Waterways are complex in the "Aegean of the Baltic." The Skagerrak is a wide passage leading from the North Sea. A sharp bend at The Skaw, or tip of Jutland, brings the mariner to the narrower and sheltered Kattegat, between Denmark and Sweden. In eastern Denmark are many islands that divide waters into three main channels. On the west is the narrow and treacherous Little Belt suitable only for traffic along the Danish mainland. Centrally is the Great Belt with few harbors and many shoals. To the east, between Danish Sealand (Sjælland, Zealand, etc.) and Swedish Skane, is The Sound, flanked by important harbors. It is relatively deep, straight, and safe. The Sound has always offered the best commercial route from Skagerrak to Baltic.

Strategic Sealand, the culture hearth of the Danes and the most important focal point culturally in Scandinavia because it lies in such close proximity to Norway, Sweden, Jutland, and Germany, has remained in Danish hands continuously during the entire period of history. Even the powerful Hanseatic League was able to control traffic in The Sound only between 1360 and 1370. Danes prospered on herring fishing in The Sound until 1425, when for some reason known best to contemporary herrings, these small fish no longer appeared. Fishing then turned to the broader waters of the North Sea, where Dutch and English were in command. On the theory that The Sound, only three miles wide at one place, was a river passing through Danish territory,



Denmark: index map

Danes started in about 1430 to levy tolls on all ships passing into the Baltic. This practice was not abandoned completely until 1857.

NORWAY

Norway has always been a Viking (men of bays, or of calm waters) country. The interests of its population have always faced westward. One sixth of its population lives on islands along the coast. Earliest raids were across waters to the west. Since 1825 over a million emigrants have left Norway for western lands continuing a movement that had been going on for over a millennium.

Some 21,000 registered fishing craft ply the rich waters of Norway's western coast in the service of some 100,000 modern Vikings. About 50,000 Norwegians reside more or less permanently on merchant ships of Norwegian registry and many others on the ships of foreign nations. In some manner, about 17 per cent of the adult male population takes to the sea. The position of Norway in the maritime world is evident from Table 5.

Table 5 Population and merchant marines

Nation	Population	Merchant marine (gross tons)	
	1939 (millions)	1939	1946 (millions)
United Kingdom	48		
British Empire	558	21.0	13.3
United States	132		
U. S., territories, etc.	151	11.5	40.2
Japan	73		0.7
Japanese Empire	105	5.6	
Norway	2.9	4.8	2.7
Germany	79	4.5	0.0
Italy	46	3.4	0.3
Netherlands	8.7		
Dutch Empire	75	3.0	1.7
France	38		
France and colonies	109	2.9	1.2
Sweden	6.5	1.4	1.4
Others	1,710	6.2	5.2

The continuing Viking tradition of Norway is due to poor opportunities for making a living in the homeland. Less than 2.5 per cent of the country is normally cultivated and only some 3.5 to 4 per cent may be regarded as agricultural land. Somewhat less than 22 per cent is forested, and roughly three quarters is waste or poor pasturage. There is little wonder that Norway is more sparsely populated than any other European country and that more than two out of every five persons of Norwegian descent are citizens of other nations.

Over two thirds of the people of Norway lived on farms in 1850 and between 35 and 40 per cent

today, a high proportion for a country in northwestern Europe. Agriculture is mainly a matter of subsistence farming. Livings are eked out under difficult conditions. Two thirds of the farms are smaller than 5 acres and 98 per cent are under 25 acres. All but 5 per cent are farmed by owners.

In order of rank, the cereal crops of Norway are: oats (the crop that withstands wetness); barley (the crop that withstands cold because it needs such a short growing season to mature its grain); wheat (the great energy crop, which, however, demands good soil and climate); and rye (the "poverty crop," producing less energy per acre, but able to grow on poor soils in cold climates). The leading position of oats reflects the excessive rainfall. Where grain can not be harvested, it may be cut green and dried as hay. In the latitude of 70° N, where the summer day is practically continuous, barley ripens eight weeks after being planted. In Skane the growing season required by barley is from thirteen to fourteen weeks. Most of Norway's wheat is grown on the 450-square-mile lowland area near Oslo, where rainfall is rather moderate. Farmers turn to rye only in places where other cereals fail. Timothy, clover, and other types of hay are the characteristic agricultural products of the wet uplands.

Potatoes supplement cereals wherever possible, especially on sandy tracts along the coast. They are small in size but are so basic in Norwegian diet that few meals are served without them.

Alps, or benchlands above the sides of fiords, and better parts of the uplands serve as hayfields and communal pastures. Widespread use of these lands is one of the reasons why people make livings on such small farms in the valleys below. In few places is hay harvested with greater effort. Most cutting is done by hand, several times each summer. Hardly a blade of grass escapes attention. Drying is difficult, requiring fence-like arrangements of wires strung on posts. These are always conspicuous features in the cultural landscape. Cured hay is transferred to *saetter*, little huts resembling log cabins. These dot landscapes above the timber line and are closely spaced in highlands ~~ways~~ immediately above inhabited valleys. In winter, when the uplands are covered by snow, hay is taken from the *saetter* and sledged to the upper ends of ~~cab'les~~ that lead to barns in the valleys below. It descends in rather small loads by aerial transport. Such is the basis of Norwegian dairying. The importance of these tedious endeavors is shown by the fact that dairy products,

poultry, and hogs produce greater revenue than all cereal crops combined.

Income derived from farms is ordinarily supplemented from other sources. The farmer normally spends part of the year fishing or working at other nonagricultural tasks. In spite of the great number of Norwegian fishermen, only about 6 per cent depend entirely on fishing for income. So many of the farmers are also fishermen that Norwegian statistical reports ordinarily fail to make any distinction between the two. Norwegian cows get used to eating fish toward the ends of prolonged winters, when the hay in storage proves insufficient. Fishing starts in March in southern Norway and follows the migration of cod northward until midsummer.

While the Norwegian farmer takes to the sea readily and with enthusiasm, he is less inclined to engage in cutting large timber. Most logging is done by people of Finnish extraction. In addition to timber and lumber, the forests produce huge quantities of pulp wood. Norwegian spruce is in particular demand by the paper industry because it is practically resin-free.

Norway lacks coal for smelting and other uses but has developed its hydroelectric resources rapidly in recent years. About one fifth of the water power in Norway is harnessed. Excessive precipitation and rugged relief combine to provide an enormous amount of energy. How well it has been utilized is reflected by the highest per capita consumption of electricity in the world:

**Table 6 Per-capita electrical consumption
(kilowatt hours)**

Norway	3,013	United States	1,019
Canada	1,839	Sweden	817
Switzerland	1,319	Belgium	557

The uses to which Norwegian electric power is put are: domestic, 46 per cent; electrochemical and electrometallurgical industries, 42 per cent; paper manufacture and forest industries, 9 per cent; other factories, 3 per cent.

Only about 4,000 persons are engaged in mining. Small amounts of copper, silver, nickel, and iron are extracted from the earth, but remoteness and inadequate transportation facilities render mining rather difficult and unprofitable. Norway's greatest metallurgical industry depends on imported aluminum ores and occurs in scattering plants along the sides of fiords. Here are delightful villages, clean and bedecked with flowers—a far cry from the grimy industrial landscapes of Great Britain.

Communications have always been difficult in Norway. The highway system is separated into several distinct units which lack overland connections. The best developed network of roads centers around Oslo Fiord, with many branches eastward toward Sweden; westward into Telemark and along the coast as far as Stavanger; and northward along the central valley, with two main arteries leading to Trondheim via Osterdal and via Gudbrandsdal. Though it is possible to drive from Oslo to practically any coastal town in southern Norway, ferrying is a common experience in the fiord region. Even between Norway's two largest cities, Oslo and Bergen, it is impossible to find a continuous, overland road. North of Trondheim a single road leads almost to the Arctic Circle. Further up the coast there are only isolated road networks around such centers as Narvik or Hammerfest, or on such islands as the Lofotens and Vesterålen.

The railroad system centers in Oslo. Trunk lines run east to Stockholm, southeast to Skane (ferry connections with direct trains to many European cities south of the Baltic), westward to Bergen, and northward to Trondheim. Many short lines along the coast are unconnected with the main network. Difficulties attending railroad construction may be illustrated by the Oslo-Bergen line, which was completed in 1909. Though these main cities are only 200 airline miles apart, the railroad runs for 492 miles, requires 179 tunnels with a total underground length of over 23 miles.

Express steamers are the heart of the Norwegian transportation system. Running on schedules that require a week for the trip from Oslo to the most distant port Kirkenes, beyond North Cape, these boats call daily at all principal places and on alternate days at many minor ports. Practically every settlement, however remote, has some feeding-line connection to the express routes. Steamers arrive on schedule, to bring mail, provisions, or friends and relatives to the little groups who stand expectantly on docks.

Though the Industrial Revolution has changed Norway in many ways, departures from the Viking tradition seem relatively minor. Upsets leading to urbanization and industrialization have been small in comparison with those in England. Fast, engine-driven steamers replace the sails, and motorboats the oars of past centuries, but life still centers along the coasts, where city sizes must of necessity remain small. Limited natural resources, especially the absence of coal, render the support of large factories and huge population centers impossible. The modern Viking is perfectly at home in a picturesque cottage near a hydroelectric plant.

Norway differs from most other countries in northwestern Europe in that it escaped the feudal system of the Middle Ages. It has few castles or remnants of large estates. No squire class ever rose to control most of the land.

During the saga centuries it was customary for raiders to gather together as equals. A chief was elected to lead an expedition and his word was law until the party returned home. The strict discipline of the sea had to be followed. The next foray might be composed of essentially the same men either with some new chief or the former leader depending on the result of another election. Traditions both of democracy and strict obedience have ever been strong among the Norwegians.

The basic political unit of the land was the *Fylkir* (neighborhood), a small territory such as might exist along one branch of a fiord. The *Fylkir* were grouped into larger, regional units, each of which was called a *Thing*. Three Things—Gula (southwest) with Songe, Hårdanger, and Bergen as chief units; Frosta (north) with Trondheim predominant; and Eidsfisa (valley) with Lake Mjosa, Hamar, and Lillehammer as chief units—became thoroughly established at an early date. Borgar (southeast), under Fredrikstad leadership, arose later as the fourth Thing. Oslo was the nodal point between the powerful southern Things and thus a natural center for political dominance.

The democratic traditions associated with the *Fylkir*-Thing system are thoroughly ingrained in Norwegians of all classes. Even after Harold's line ran out in 1319, and during the long period that Norway was in Danish, Hansard, and Swedish hands, the Norwegian exercised rather complete political control over his own territory, asserting and enforcing his political independence in all local matters and recognizing almost no class distinctions.

Efforts to designate a boundary between Sweden and Norway began as early as 1771 but it was not until 1905 that a plebiscite in favor of independence resulted in total political separation of the two countries. On gaining independence, the Norwegians elected the grandson of King Christian IX of Denmark to their throne, the most democratic monarchy in the world.

URBANIZATION

There are almost seventy places officially recognized as "cities" in Norway, but only seven have a population of over 10,000 and four over 40,000.

Only one out of every six Norwegians resides in any of the four largest cities, and less than 10 per cent of the country's population lives in Oslo, the capital and largest city. This is an extremely low degree of urbanization for a country in the Northwestern European culture realm.

Limited urbanization reflects both the great percentage of people engaged in agriculture and the nature of Norwegian industries. Timber industries lead to the building of saw mills, paper factories, and other establishments that may be individually large, but they are scattered about near sources of power and wood in places unlikely to become cities. Hydroelectric plants, in a similar manner, locate important industries at such minor places as Notodden, Rjukan, or Odda; but a single waterfall or dam cannot become the basis of important urbanization. While relatively numerous, the streams of Norway are small.

Oslo has a population of less than 438,000. In the midst of Norway's best lowlands and largest agricultural region where wheat grows, it follows the London pattern in having become a political center. About 15 per cent of the land near Oslo is plowed, a high proportion for Norway, but, of course, extremely low for most northwestern European nations.

Oslo was founded by King Harold in the eleventh century at a site near the existing city. Kristiania was founded at the present site by King Christian IV in 1624. The two were so close that the name of one commonly included the other. Kristiania had been in use during the days of Swedish domination and even after the political separation in 1905, but in 1925 the Norwegians reinstated the older name, Oslo.

Serving as seaport for the central valley, Oslo has long exported timber products. Modern commercial developments have resulted in its handling about half of all Norway's imports and about one sixth of the exports. Growth of the city has resulted in increased population density in nearby lowlands to about 200 per square mile, an enormous concentration for Norway.

Bergen, with nearly 115,000 population, has a much older tradition than Oslo. It was an important local capital prior to the Hansa period, and long the leading commercial post in Norway for those Baltic merchants. Tyskebyggen, the old German port now in central Bergen, is one of Norway's few interesting and picturesque monuments of Middle Ages origin. Bergen remained Norway's largest town until about 1800.

Bergen's harbor is one of the finest in Scandinavia. It is deep enough for the largest steamers

and protected from high tides and storm waves, but it lacks hinterland. It serves as a center for hydroelectric and fishing industries that lie scattered along the coast and carries on an active trade with the Americas and Europe. Bauxite from South America comes to aluminum plants in the vicinity of Bergen and local pulp factories supply bulky cargoes for outbound ships.

Stavanger, to the south, with a population of about 45,000, carries on the largest herring and herring trade in the world. Its 70 canning factories supply most of the Norwegian sardines that reach the United States.

Trondheim, third city of Norway, with a population of over 58,000, is surrounded by the best lowlands on the west coast. It dates from before the year 1000 and was long the ecclesiastical capital of Norway. Most Norwegian kings have been crowned in its Norman-Gothic cathedral. Diversified products from the surrounding territory, including those derived from dairying, fishing,

lumbering, and mining industries have given Trondheim stability. Direct railroad connection with Sweden and steamship connections with points to the north combine to make the city Norway's third port. It is the main naval base. Kristiansund, to the west, is an island outpost with a population of 15,000 from whence vast quantities of dried fish (clipfish and stockfish) are exported, mainly to Latin America.

Narvik, on Ofotfjord, east of the Lofotens, is the terminus of an electric railroad from Sweden. Its ice-free harbor is used to export Swedish iron ore from Kiruna and Gällivare. *Tromsø*, still farther north, is the center of trade with Svalbard and other Arctic points. *Hammerfest*, somewhat over 70.5 degrees from the equator, boasts of being the northernmost city in the world. It is a fishing center in tundra surroundings and market for reindeer hides and other Arctic products, with a population approaching 4,000. Several other fishing centers dot the coast beyond North Cape, largest of which is Kirkenes near the border of Finland.

10: Sweden, Denmark, and Iceland

Though thoroughly Scandinavian, Sweden has had Baltic rather than Viking interests. An exception to this generalization occurs among people north of The Sound on the west coast. Inhabitants of this Bohuslän (west) Coast face the North Sea, breathe salt air, fish in salt waters, and have always had Viking interests. Other Swedes live around lakes, in forests, or along coasts that face the relatively fresh, fish-impooverished Baltic.

Comparatively long and warm summers favor the maturing of crops in southern Sweden. Even in latitudes similar to those of Norway, inland position assures warmer summers and less rainfall during harvest season. It is said that ancient Norwegians long refused any attempt to harvest grain, but Swedes did so at an early date. The agricultural ties of Sweden are far deeper than those of Norway.

CULTURE BACKGROUND

The southern plains of Scandinavia were attractive areas even to settlers in prehistoric times. Nordic peoples gradually differentiated into such groups as Goths, Jutes, Angles, and Swedes. To the north were Ural-Altaic-speaking "primitives," such as Lapps and Finnish tribes. The Goths had a stronghold in Skane and territory just to the north, Götaland. Though the name Jutland suggests their presence at some early date, Jutes were settled to the southwest along the lower Rhine by the time that historic records approach reliability. Angles occupied most of Denmark, to be replaced by Danes as the former emigrated to England. Swedes (Svear, Sverige is the actual name of Sweden today; Norge is the actual name of Norway) lived in Svealand around the great Lake Malar and along the coast to its south.

The inhabitants of Skane and the "Aegean of the Baltic" quite naturally turned to trade at an early date. During the Bronze Age (1800-500 B.C.) they were in contact with Mediterranean peoples who prized amber from Samland—the coast of the southeastern Baltic. Amber routes were first established down the Elbe and later down the Oder and Vistula. Amber was highly valued as gem material by peoples who lacked means to

polish hard stones. By the third and second centuries B.C., traders from Skane were finding their way to the Black Sea, and Mediterranean gold was coming back to Sweden.

Important to the mind of all Nordic peoples has always been the idea of the *mark* (march), the frontier. It might consist of forest, pasture lands, or waste. It lay ahead of the homeland and always presented a challenging prospect for conquest or for commercial domination. Mark regions were areas where "primitives" might be conquered.

To the Swedes, marks lay to the east, southeast, and north. The land of the Goths, south and southwest of Lake Vätter, was not a typical mark. It was attractive territory undergoing active development agriculturally. Its peoples were not primitive. Nordics, however, were generally as prone to plunder or conquer settled lands as frontiers. The prizes might be even more valuable.

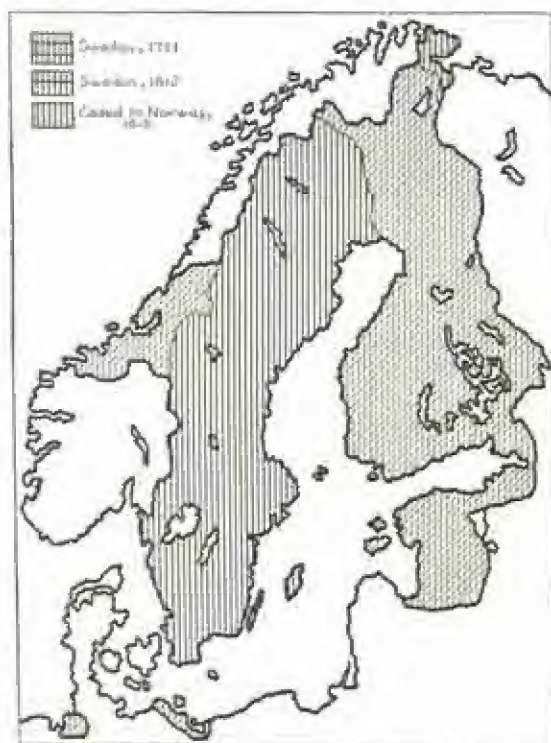
Many skirmishes led to conquest of Gothic territory by Swedes in the sixth century, establishing political unity in southeastern Scandinavia. It was not a matter of complete peace, however, because the Goths had been Christianized by the Danes while the Swedes were to remain pagan until the year 1150. Religion became the cause of many conflicts. Uppsala, the capital and ecclesiastical center of the Swedes, held firm against the Christianity of the southwest. Political unification of southern Sweden gave strength that soon became the basis for aggressive expansion in other directions into the marks.

In about the fourth century new peoples were appearing in central Europe. Huns, Avars, Bulgars, and Magyars were advancing from somewhere in the east. Slavs, who had long occupied lands in and around the Pripyet Marshes, in what is now White Russia, were soon to start pushing westward across the German plain. Ancient Germanic trade routes to the Mediterranean were being disrupted. Of course Mediterranean civilization was being disrupted too, but the Roman Empire was far away. The concern of such peoples as Swedes was concentrated on events at closer hand.

In the ninth century the tide turned. Germanic-speaking peoples began driving Slavs eastward. Rurik, from Sweden, advanced far into the mark

across the Baltic, eventually becoming ruler of a vast territory extending up the basin of the Dvina into the upper reaches of the Volga. The very name Russia stems from this important march. Rurik's followers were known as the Routs, from whence came Rus, Rusi, and the anglicized, Russia. Rurik's son Igor extended the march to Kiev, and vainly attacked the wealthiest and most important city in all Europe, Constantinople. Nordics thus came to grips with such remote peoples as Bolgars and Arabs. Igor's widow Olga became a Christian and was received by the Byzantine Emperor in 957. Her nephew Vladimir left descendants who retained some power in Russia until the end of the twelfth century. Swedes turned these Nordic conquests to great advantage commercially. Russia's rivers led to Swedish islands and coasts.

Meanwhile, Germans expanded their lands. By 1158 they appeared at Lübeck just south of Danish territory and established their first Baltic stronghold. During the latter part of the twelfth century they founded other ports eastward along the south shore of the Baltic, and a merchant colony at Visby on the island of Gotland off the eastern shore of Sweden. Visby prospered and became a great center for trade with Riga and other places,



Sweden, 1721-1815

even to the east of Baltic coasts. Baltic trade was flourishing. Various foods, rye and wheat, flax, and amber, came from the eastern Baltic lands. Honey, then the only form of sweetening known to northern Europeans, came from Russia. Sweden supplied forest products, such as timber and pitch for boats, iron, and copper. Germans had salt from mines not far from Lübeck and from Halle, and silver from their central uplands. Norway provided fish, fur, and timber.

Swedes were incapable of competing seriously with German trade for several reasons. There is a great deal of evidence to indicate that winters during the thirteenth and fourteenth centuries were much colder than those of previous centuries in northern lands. Many Viking voyages prior to the twelfth century led across seas that are normally frozen today. The settlement in Iceland had occurred during decades or centuries of relatively mild winters. It is improbable that the Greenland settlement would have taken place at all had the weather been as cold as it is at present. The loss of contact with Greenland began in the twelfth and thirteenth centuries. The pulse of Scandinavian activities seems to have slowed generally. After a period of aggression, culminated by the success of Rurik and his followers, the Swedes slowed down. Many attribute this to increased difficulties in making a living at home under less favorable climatic conditions. Another important factor was the Black Death, a plague that arrived in Sweden in 1349 to ravage and greatly weaken the country.

It was the Danes who arose to threaten German supremacy in the Baltic. Visby was sacked and its greatness ended in 1361. The Danish "Sea Queen" Margaret unified Scandinavian lands in 1397 under the Treaty of Kalmar. A rapid decline in German activities followed. The Hanseatic League of German commercial cities, founded in the middle of the thirteenth century, reached its zenith in 1397. The Danes started a decline that led to death of the League soon after the Voyages of Discovery turned thoughts to New World possibilities. Lübeck, the Hanse capital, suffered from the failure of herrings to appear in The Sound after 1425. It suffered even more when the Baltic turned out to be a remote base for world trade.

The Danes were powerful enough to deny to English and Norwegian fishermen the right of fishing in Norwegian waters in 1410. Toward the end of the century they also banned them from Icelandic waters. These acts may have contributed more than we realize to the discovery of America by Columbus. Bristol fishermen were sent farther afield, and with them went many Italians, including Columbus.

The Dutch had so expanded their merchant marine that by the start of the sixteenth century the Baltic was again pretty much of a Frisian sea. Hansards suffered severely from Dutch competition. The final blow to the League, however, was dealt by the Swedish King Gustavus Vasa, who dissolved the Union of Kalmar and broke all Hansard power in 1523.

The seventeenth century was a time of Swedish ascendancy. A lively trade with the Dutch, in iron and copper, was bringing commercial prosperity. Eastward and southward expansion through conquest resulted in an Empire of some 350,000 square miles, with a population of three million. The zenith was reached in 1658 when Sweden gained full control of the east shore of The Sound. All of Finland, Estonia, Latvia, parts of Lithuania, and a great deal of the coast of northern Germany, together with the important North Sea port of Bremen and other important centers to the east in Pomerania were in Swedish hands.

Decline was comparatively rapid. In 1709, Charles XII of Sweden suffered a crushing defeat by the Russians at Poltava. By 1718, Swedish domination of the Baltic was ended. Part of Finland was lost to Russia in 1743 and the rest in 1809. The Russians then extended their domains to the Åland Islands at the mouth of the Gulf of Bothnia.

SWEDEN

Sweden contrasts with Norway not only in its eastward outlook during much of its history of territorial and commercial imperialism but also in many physical advantages. It contains as much good agricultural land as Denmark, and even its lake district west of Stockholm is larger and better suited to agriculture than the central valley of Norway. Altogether, 12 per cent of its area is agricultural, nearly 60 per cent forest, and but 28 per cent waste. The latter is of less consequence than it sounds because it includes all water surfaces, and these amount to 8 per cent of the entire country and are by no means useless. Most of Sweden has moderate rainfall, so problems of drying hay and of harvesting crops are not nearly as difficult as in Norway. The country is also fortunate in possessing valuable mineral ores.

Skane is part of the European Plain; low, fertile, and underlain by relatively young rock. Götaland not only possesses a commercially important maritime coast but also contains large areas of productive farm land. Svealand is stony ground, here and there covered by moraines or crossed by strips of valley alluvium. White birch trees, "ladies of the forest," grow on its rolling hills and on islands

within its many lakes. Most crops are raised at elevations of less than 600 feet.

Marches northward from these southern lands, into broad taiga forests, resulted in political control of lands originally inhabited by Finns, and still farther north, into the borders of the tundra, where Lapps still roam. In the long run, the mark nearest home turned out to be considerably more significant than the spectacular extensions of territory when the old Empire approached its zenith. To the north of Svealand are forests and mineral resources that have proved extremely valuable. Sweden's position as one of the leading commercial nations of the world depends to a far greater degree on the natural resources of its northern, barren lands than on agricultural prosperity of its more attractive southern territory.

Some sixty large rivers cross northern Sweden. These serve as transportation routes, one of their most important functions being channels for the rafting of timber. More recently, they have become valuable sources of electric power.

To the north in Upper Norrland, Sweden reaches into the Polar World. From the cultural standpoint this region is known as part of Lapland. It is estimated that some 17,000 Lapps reside in Norway, 7,700 in Sweden, 1,600 in Finland, and 1,700 farther to the east in Kola Peninsula of the Soviet Union. These Mongoloid people retain a tradition of having been conquered by Tschouds, a Finnish tribe whose language they adopted. Though many are nomadic and are members of the Polar World, others live in turf huts equipped with glass windows, with possessions such as alarm clocks and sewing machines.

Swedish Lapland contains valuable ore deposits that have not only established several important mining centers but also a railway network with connections leading to Norwegian Narvik, Stockholm, and to the Finnish railroads.

Though Sweden did not become a land of great factories, it was profoundly changed by the Industrial Revolution. The earliest change was in the direction of becoming a source of raw materials, especially for England. The English on 20 occasions between 1658 and 1840 sent naval expeditions to maintain the "freedom" of The Sound. In 1801, Nelson bombarded Copenhagen and destroyed Denmark's little navy because the British needed timber products and ores from Sweden badly enough to fight for them.

Sweden's mineral trade depended on copper from Fahlun, silver and lead from Sala, and iron from Grängesberg. By 1730 the mines of Dannemora, a short distance north of Stockholm and

Uppsala, supplied over one third of Europe's malleable iron, three quarters of which went to England, and half of the pig iron, half of which went to England. Exploitation of natural resources so occupied the Swedes that by the latter part of the eighteenth century, they no longer fed themselves. Rye had to be imported in large quantities from Riga.

The Göta Canal was completed in 1832. Only 56 of the 240 miles of this waterway are actually artificial, but its construction was a major undertaking. Boats are lifted to a culminating elevation of 300 feet, requiring seventy locks. This "river and lake route" crosses the main lakes of Svealand and winds through a variety of picturesque landscapes that arouse admiration from all who make the trip. It was built to enable Swedish products to move from Stockholm to Göteborg without having to pass through the Danish Sound. The canal is still busy commercially and attracts a heavy tourist trade.

More recent years have witnessed a closer

approach to a balanced economy. Need for food brought 45 per cent of Sweden's agricultural lands into productivity between 1820 and 1879. The percentage of the population on farms has declined according to northwestern European patterns. In 1870 about 52 per cent of the population was on the land, less than 10 per cent was industrially supported, and only 2 per cent was commercially supported. In recent years the agricultural population has declined to about 35 per cent, while the industrial has risen to 31 per cent and commercial to nearly 13 per cent. The urban population increased from 10 per cent in 1800 to 21.5 per cent in 1900, and about one third of the population now reside in cities.

URBANIZATION

Stockholm has been the chief beneficiary of the Industrial Revolution and other changes. Located on a dozen islands between Lake Malar and a number of complicated inlets that lead to the sea through a maze of skerries, it was close to such early centers of Swedish cultural development as Birka, Sigtuna, and Uppsala. The city was founded as a military stronghold after Baltic pirates burned Sigtuna in 1157. As a political center it has served as capital for some seven centuries. The existing royal palace was started in 1697.

Stockholm is favored by rather central position in the "Baltic Lake." Its harbor is excellent and thoroughly protected from storm waves. Nearby were the copper and iron deposits that started Sweden's metallurgical activities as well as the extensive forests that established lumber industries. Easy routes lead to Göteborg, Copenhagen, Oslo, and Trondheim. With such advantages it far outstripped the towns of Skane and even the great port on the Bohuslän Coast, Göteborg, as a commercial center. In spite of location on the eastern side of the peninsula, it imports more goods than its west-coast rival.

This "Venice of the North" is commonly regarded as Europe's cleanest and most modern city. A great deal of its modernization is due to prosperity that arose during World War I when Sweden managed to maintain its neutrality and profit from sales of iron, steel, and other wares to participants on either side of the conflict. Though the population of Greater Stockholm approaches one million, it includes less than one seventh of the nation.

Göteborg is one of the earliest examples of city planning and location by deliberate design. Gustavus Adolphus called in Dutch merchants and planners for advice on the establishment of a Swedish commercial outlet that would be free of



Sweden: index map

Danish interference. He followed the advice in detail. It was under such conditions that Göteborg was founded in 1619. It prospered from the start and between 1730 and 1820 gave indications of becoming the greatest port in Scandinavia. For over half a century after 1820, however, came a period of depression, mainly because of inability to meet the competition of Copenhagen. Considerable prosperity has been regained during the twentieth century. Total tonnage now exceeds that of Stockholm, and the city has become Sweden's largest shipbuilding center. With west coast advantages similar to those of Liverpool for trade with overseas countries, it occupies the best position for commerce with the British Isles. Göteborg is Sweden's second city, with a population approaching 350,000.

Malmö is the Swedish complement of Copenhagen. As third city of Sweden and first of Skane it has a population of slightly over 189,000. Old agricultural interests are evidenced by many plants for food processing, such as beet-sugar factories. There is considerable industrial activity centered in shipyards. Commercially the city is important mainly because it is the eastern ferry terminus of a short route to Scandinavia's greatest metropolis, Copenhagen.

Much of the recent urbanization in Sweden has taken the form of small manufacturing centers, especially in the belt between the two largest cities. Borås and Norrköping have become important cotton textile producers. Jönköping is the home of the great Swedish match industry. At nearby Huskvarna are factories making bicycles, motors, sewing machines, rifles, steel furniture, and other goods.

To the north are mining centers. Bothnian ports serve both them and lumber mills during the summer when the Gulf is open. In winter the only steamship lane through the ice is that between Stockholm and Turku, in Finland. If Swedish products must be shipped from territory west of the Gulf of Bothnia during winter, it is necessary that they be sent by rail.

ECONOMIC POSITION

Though 80 per cent of Skane and 40 per cent of Svealand is now under cultivation, Sweden grows but 60 per cent of the wheat and 90 per cent of the rye it uses. About one fifth of all imports are foods.

Skane is close to the northern limit of wheat growing. New varieties from the Soviet Union may alter the trend, but during recent years Swedish agricultural economy has more and more changed from emphasis on wheat to greater reliance

on stock raising and dairying, with sugar beets supplementing income from hay, barley, and oats.

From Svealand northward, farmers combine agriculture and forest occupations about as readily as Norwegians combine agriculture and fishing. They are likely to go into the woods during the cold season when farm lands lie dormant.

Few deciduous trees, such as oaks, elm, or linden, grow north of a line that runs from near Oslo through Falun to Gälve (Gelfe) on the Gulf of Bothnia. To the south, lands with oaks, traditional indicators of agricultural fitness, have been generally cleared. To the north are the spruce, pine, and fir forests of the taiga. It takes about eighty years for a conifer to mature to the point of being usable for lumber in southern Sweden and about twice that long to the north. This is slow growth; which means that the annual rings are narrow and the wood is strong and easily worked. Lumber from taiga trees always commands a premium. The least useful coniferous wood comes from warm climates, where rings are wide, so that checking and warping reduce greatly its value as lumber. There is also much useful birch in the taiga. This hardwood is practically grainless and is nearly white; qualities that place it in demand for many uses, such as for furniture.

Useful forest covers about 40,000 square miles of Sweden. Heavy snows render logging easy. Some 19,000 miles of rivers float logs toward 60 ports. Floating is about one seventh as expensive as rail transportation. Over 1,000 lumber mills and 100 pulp factories yield about half of Sweden's exports. Some one seventh of the world's paper supply originates in Swedish forests. Nearly three quarters of the production is exported. Resin is a valuable by-product. Lumber is the leading export, but an increasingly large amount of wood is being used for manufacture at home, so that it may be exported in items ranging in size from matches to large pieces of furniture.

Mining is responsible for about one quarter of Sweden's exports. For many centuries Dannemora supplied the purest iron ore known to Europeans. Subsequent developments spread the district westward through south-central Sweden to territory just north of Lake Vänern.

The earliest smelting depended on charcoal from nearby forests and most of the product was shipped to England as pig iron and bar iron. During the middle of the nineteenth century, steel manufacturing was started with imported coke. Swedish steel soon became regarded as a standard of excellence.

The centers of mining activity shifted northward when new deposits were found in Lapland, especially as the result of the Gällivare and Kiruna finds in 1894. An electric railroad, run by Porjus River power, connects the principal mines with Lulea on the Gulf of Bothnia, for summer export, and with Narvik, for export at all seasons. The most common types of iron ore contain about 40 per cent iron. The percentage in Swedish ore is closer to 60, which materially reduces costs of exploitation. Germany has been the principal buyer during recent decades, though some has found its way to England and other countries. About 80 per cent is exported as ore.

About 25 per cent of Sweden's hydroelectric power has been developed, chiefly along the Dal and Gota rivers toward the south. Rivers and lakes, covering about 6 per cent of Norrland, are here and there harnessed to provide power for lumbering and railroads. Limited quantities of oil shale are exploited in southern Sweden. Sawmill waste, traditional fuel for mills in other lands, is utilized for pulp. Most railroads are electrified and Sweden has more rail per capita than any other country. It also leads in telephones per capita. In Stockholm there is one phone per four residents.

DENMARK

Denmark has an extraordinarily important place in the world for a country of its size and population. The British Isles occupy only about 97 per cent as much area as Norway or 70 per cent as much as Sweden, but they are about eight times larger than Denmark, with its 16,575 square miles. Denmark's population 4.3 million, exceeds Norway's 3.3, but it is well under Sweden's 7.1.

Denmark's main asset is strategic position. It is both at the gates of the Baltic and central in northwestern Europe. There is also the asset of political permanence. Danes have maintained their own culture and government on Sealand at least as far back as the sixth century. No other European nation has such a record. The immense agricultural productivity of Denmark has not been based on good soil as much as excellent judgment. Danes have exhibited remarkable ability to make the best use of their meager soil resources. The country lacks coal and other significant mineral resources.

The main parts of Denmark are the mainland (Cimric) peninsula of Jutland and the large islands of Fyn and Sealand (Sjaelland). In addition are some 350 small islands, 100 of which are inhabited. Land is flat. Only a small amount of

the country rises above the 200-foot contour, and none above 500 feet. Most of the topographic irregularity is of glacial origin consisting of moraines with rolling surfaces. Western Jutland is a region of very poor soil, much of it being covered by sand that was formerly drifted about by winds. Groves of pine and fir were planted to hold the sand in place. Even when thus "fixed," the sand is poor soil. Some areas are stony and barren. Morainal hills block pre-Ice Age drainage courses, so that they are responsible for many bogs that require draining before being converted into useful land. Eastern Jutland and the larger islands resemble Skane in being relatively good crop land. Long backward, western Jutland is the place where the greatest rural population increases have taken place in recent years as a direct result of extensive reclamation projects.

CULTURE BACKGROUND

During the Middle Ages, Danes and Norwegians were closely united in Viking exploits and colonization. Esbjerg on the west coast retains the Viking tradition. It is the most important fishing port in Denmark. Denmark ranks next to Norway in the tonnage of merchant vessels on a per capita basis. The population is so small, however, that it does not qualify for inclusion in Table 5. The retention of Bornholm in the Baltic, and of North Atlantic islands is a heritage from Viking expeditions.

Sealand has followed a course of cultural development similar to that of Skane. In fact Skane was in Danish hands so much of the time and was so similar physically that no other course would have been likely. The Danes entered into Baltic trade only in a minor way, excepting that they were able to control The Sound for a great length of time and were active in disputing the trade rights of Hanse merchants and the Dutch. Tolls were exacted from ships passing Helsingör just north of Copenhagen.

The Danes were Christianized at a very early date and became the chief agents for the spread of that religion in Scandinavia, various Baltic lands, and the North Atlantic islands.

The nineteenth century brought great hardship to Denmark. The British were ruthless in wresting trade with Sweden from Danish control. Denmark lost control of The Sound. Prussia, in 1864, took Schleswig in southern Denmark, depriving the Danes not only of valuable agricultural lands but also an overland trade route that long served as the equivalent of the Kiel Canal—a shortcut from the North Sea to the Baltic.

The two most interesting modern developments

in Denmark have been the rise of Copenhagen as the leading city of Scandinavia and the development of intense agricultural activity in the country as a whole.

COPENHAGEN

København, "merchant's haven," occupies the site of an extremely ancient fishing village dating from prehistoric times. It, however, officially recognizes the Bishop Absalon as its founder in the twelfth century, when it became a fort against Slavic aggression. Displacing Roskilde, a short distance to the west, and all other places nearby that might rival it commercially, Copenhagen rose as a political center.

Like all other great trade centers, its population increased enormously during the last century. From about 100,000, in 1800, the rise has carried to about 1.7 million today. The city contains more people than Stockholm and Oslo combined. About 22 per cent of all Danes live there.

Strangely enough the first main impetus in the growth of Copenhagen came as the result of herrings deserting The Sound. Lübeck lost a great deal of its trade and Hanse power was dealt a severe blow. Then came struggles between the Low Countries and Spain, which sapped the commercial power of the rival Dutch. Eventually an extremely shrewd move was made in the establishment of a *free port* outside of the Danish customs territory in Copenhagen. Entrepôt trade could proceed freely. Imports entered without customs duties, later to be shipped to various parts of Scandinavia or to other Baltic ports. Within recent years Copenhagen has become one of the world's great cosmopolitan centers. Sailors from all parts of the world may be seen on its streets. A merchant ship has little difficulty in discharging or finding a full cargo. Hundreds of smaller vessels carry goods to and from various Scandinavian and Baltic destinations. Two handicaps exist: shallowness of The Sound denies entry to some of the largest ships and the Kiel Canal by-passes Copenhagen. But in spite of these handicaps, no Scandinavian or Baltic rival threatens the commercial supremacy of Denmark's great city port.

The leading city of a small agricultural country without mineral or power resources worth mentioning could hardly be expected to become a great industrial center, yet Copenhagen carries on an amazing amount of manufacturing. The products are mainly of agricultural origin, such as gloves, cheese, butter, margarine, beer, and sugar. Porcelain wares are manufactured out of clay from Bornholm. Ships are built and repaired. Power

for both industrial and domestic use is imported in the form of electricity which arrives by cable from Sweden.

AGRICULTURE

Denmark rose to agricultural pre-eminence only during recent decades. Danish butter had a bad reputation as recently as 1870. An important role as provider of bacon, eggs, and butter to England and Scotland has been assumed only since 1890, and mainly since 1918.

In recent years Denmark has exported more butter than any other country and more bacon than any other except the United States. About two thirds of the food export has gone to Great Britain.

About 44 per cent of Danish population is urban and only one third agricultural, but 75 per cent of the country is under cultivation. This high percentage and the rapid rise in agricultural activities is due largely to the cooperative movement among farmers. This movement has firm foothold in all Scandinavian countries and Finland, but it is most perfectly developed in Denmark. Close to half the population belongs to cooperative societies. These buy in large quantities and sell cheaply to members. They also sell under conditions most advantageous to members. Co-ops handle about 95 per cent of the marketing of all farm products, supply most needs of farmers, and carry on a large urban trade. They have employed experts to improve farming methods, assisted in reclaiming land, revolutionized merchandizing methods, and they have been influential in getting laws passed to benefit rural peoples.

Danish agriculture is intensive. Over half of all farms are under 13 acres in size and 70,000 are under 2 acres. Very few exceed 100. Owners operate 90 per cent of all properties and this percentage has been rising. Anyone who can deposit 10 per cent of the value of a farm may purchase, with government aid. Improved methods have made farming so profitable that rural districts have been gaining in population. This pattern is unique.

The extreme contrast in agricultural developments between Denmark and England raises interesting questions. The English experience is one that has led to larger properties, more expert management, greater production with fewer people employed, and a high degree of specialization. It is a pattern suggesting that Soviet methods may be the ultimate goal of agricultural development. This trend is rather general in Europe and during

recent years in the United States. It is estimated that 5 per cent of the population of the United States could feed the entire country. The number of people actually on farms at present is closer to that figure than most people realize. Denmark has reversed practically all these trends and has found its action highly profitable. Of course the presence of a ready market directly across the North Sea makes Danish prosperity possible. If the purchasing power of the British remains low for any considerable length of time, Denmark will suffer accordingly. The world couldn't support a Soviet Union or United States as intensively farmed as Denmark.

ICELAND

Celtic monks from Ireland were the first inhabitants of Iceland. Norwegians and Danes soon followed. An Irish strain remained, but soon it became diluted beyond recognition. It is estimated that about 20,000 Norsemen settled in Iceland between A.D. 870 and 930. By 965 the population was 60,000. British joined the Norse immigration, so that prior to 1000 they constituted about 12 per cent of the population. In 1096 the population had risen to 77,000. The Black Death in 1202-1204 killed about one third of all Icelanders. The appearance of severe climatic conditions slowed the pace of population increase. Population has fluctuated rather widely during more recent centuries, being around 50,000 in 1670; 37,000 in 1790; 72,000 in 1871; 100,000 in 1900; and 145,000 in 1951. Disease and volcanic catastrophes killed 29 per cent of the inhabitants in the late eighteenth century.

Politically Iceland has been a republic, from every practical standpoint, since the founding of its Parliament in 930. It is commonly credited with being the oldest republic in northwestern Europe and its Parliament is the oldest governing body with a record of continuity in the world. Iceland has not been wholly independent, however. It joined Norway in 1263 and both were incorporated into Denmark in 1381. When Norway left Denmark in 1814, the people of Iceland elected the Danish King as their own, but did not recognize any other governmental connections. The political status of Iceland as a republic was not materially altered by these foreign affiliations. The Norwegians extended the same political freedom in all local matters to Iceland as they demanded from others. In 1918 Denmark formally recognized the independence of Iceland and in 1944 Iceland broke off all ties with the King. It

has since asserted its complete independence in demanding the withdrawal of American troops and airways activities from its soil.

From the commercial standpoint, Iceland was under Hanseatic trade monopoly for a short period and under Danish monopoly between 1602 and 1854.

The language of Iceland is essentially Norwegian of 1,000 years ago. All Scandinavian languages were the same until the seventh century, when primitive Scandinavian, or Old Norse, was differentiated into eastern and western branches. The complicated grammar of the original tongue is retained in Icelandic because its literature was developed at a very early date. Only the Sagas of the Norwegians are as old. Swedes and other mainland Scandinavians developed their literature much later, after people had discarded a great deal of grammatical complication. West Norse was the base of Icelandic. In a modified form it is represented on the mainland by Landsmal, the rural dialect of western Norway. East Norse split into Swedish and Danish. Present day Riksmal, the official language of Norway, is Dano-Norwegian, hardly more than a dialect of Danish. The Norwegians are making strenuous efforts to get away from Danish so as to have a real national tongue of their own. No recent Norwegian father and son have been educated under the same spelling, four official changes having been made since 1905. Radio stations in Oslo broadcast proudly in Riksmal to a rather limited audience. People over a much wider area listen to the Landsmal of the station at Bergen. Scholars turn to a rich literature in older forms of West Norse. In contrast, the spelling of Icelandic has not changed since the thirteenth century, and the spoken language of the people is not so changed but that every educated Icelander can read the old sagas without difficulty.

Though Iceland approaches 40,000 square miles in area, the amount of plowed land is normally but 65,000 acres. This minute fraction in crops is a reflection of adverse climatic conditions. During the saga age, barley was able to mature during the short growing season at 64° N. By the fourteenth century the growing of cereals had been given up. Under existing conditions, barley matures in some years but fails in others. Flax is grown. The principal planted crop is oats, which is cut before maturity to be used as fodder. Rains interfere with curing of hay, as in Norway.

Iceland is plagued with a soil condition common to many subarctic lands, a difficulty in keeping fields flat. Cultivation leads to hummock formation. These irregularities are thought to be caused by frost action and are accentuated when the sur-

face is plowed. Flattening the fields places an additional burden on the farmer.

Potatoes were introduced in 1759 and were found to grow well in heated ground near hot springs. Turnips, rutabagas, kale, cabbage, lettuce, horseradish, spinach, and rhubarb are the main garden crops, the root crops being used largely for feeding cattle and horses. At Alfanes in the extreme southwest, where winter is mildest and summer longest, onions, cress, and parsley were introduced with fair success in 1890.

In spite of a relative decline there has been an absolute increase in the agricultural population. Nearly 75 per cent of the population was agricultural in 1880, but only about 40 per cent is agricultural at present. Meanwhile the population of the entire island increased enough so that the number of people on farms is actually slightly greater than in 1880. The main rural occupation is sheep raising.

Fish exporting was started by Icelanders during the thirteenth century, and a lively trade developed with England. This was ended by the Danish trade monopoly established in 1602. Hardship followed, as might be expected in a land where the official fare of prisoners had been fish and water for nearly ten centuries. Fishing revived with the lifting of Danish restrictions in the middle of the nineteenth century but did not become a flourishing industry until about 1900, when ice was introduced for preserving bait, and Icelanders adopted such modern methods as the use of drift nets and boats with auxiliary motors. It was also aided by the establishment of training courses in navigation and seamanship. Fishing now yields directly the living of about one fifth of the population and has done much to stabilize the commercial activities of the rest of the population. About 90 per cent of the catch is cod, which goes in frozen form to England, or salted to France and Mediterranean countries.

During the saga age there was fairly adequate communication between Iceland and Europe, or even between Iceland and Greenland. This condition changed with increasing cold and storminess in the North Atlantic, so that Iceland became extremely remote to Europeans, and Greenland was lost. Even so recently as between 1776 and 1850 there was but one regularly scheduled mail per year between Iceland and Denmark, and none to any other land.

Regular steamship service between Iceland and Denmark started in 1858, but by 1875 there was only one ship on the run, with seven scheduled trips to Copenhagen per year. Recently, Iceland has established its own steamship line and some of its ports are visited regularly by ships of other

nations. Coastwise traffic involves 22 ports of call, but Iceland has few really good harbors. Cable connections with the mainland were established in 1880 and a wireless station in 1930.

Iceland is barren and naturally treeless. Were the annual precipitation greater, much of the island would be covered by icecap. The annual precipitation is less than ten inches at most places and the northwestern and northern portions are deserts of aridity as well as of cold.

Much of the interior is covered by fresh volcanic ash and is practically devoid of plant life. To the south, where some volcanic peaks approximate the elevation of 7,000 feet and an extensive plateau rises above 3,000, precipitation is heavy enough to support several icecaps of moderate size. The southeastern coast is particularly scenic, because the highest mountains of the island lie not far from the shore and excessive precipitation maintains many well-fed streams. The only part of Iceland really suitable for agriculture and habitation lies to the southwest, where January temperatures are relatively mild (in a small area, above 32° F.), and precipitation is moderate. The main climatic drawback is that July is so cool—average temperatures rising only slightly above 50°.

Reykjavik, the capital, has a population of 53,000 and is the only real city. Four other settlements, in the 2,400-4,000 class complete the list of places considered as urban, stretching the interpretation of the word to the limit. The capital is supplied with natural hot water from springs at nearby Laugarnar, which is useful for heating buildings, public baths, and laundries. Aside from a small tourist trade, the main interests of the city are commercial and political, the commerce being almost totally concerned with fish. Geysir, the original spouting spring after which geysers are named, lies not far inland.

Hydroelectric development is hardly in its infancy. In years to come it may become the basis for industrial development.

Long ages of isolation have ended with the establishment of air routes. Iceland is conveniently located with reference to great circle (shortest) routes between important points in North America and Europe, so that it is a natural way station to be visited by increasing numbers of people. It will be interesting to see whether this change will result in a complete cultural upset in which people of long residence in so remote a place will substitute the ways of others for those their own.

It will also be interesting to see whether new contacts raise living standards. Prior to the start of World War II, Iceland had no army, no fort-

no unemployment, and no public debt. But it also had no railroads, few miles of roads, and very little industrialization.

ARCTIC ISLANDS

Jan Mayen, to the north of Iceland, Svalbard, about 370 miles north of North Cape or the same



Viking exploration

distance south of the North Pole, and Bear Island, about halfway to Svalbard, are colonial possessions of Norway. Of these, only Svalbard (Spitzbergen) is significant. It was discovered in 1194 but soon forgotten because it was uninhabited and appeared to be a bit of Arctic scenery not worth claiming. Barents rediscovered it in 1596, and since that date it has remained known to Europeans. For a while the island served as an important whaling base, but now it has been found to contain coal, iron, copper, lead, and possibly petroleum deposits. A population of 3,000 is resident at six permanent coal camps, the entire output belonging to Norway. The mining has been conducted by Russians. Partially for that reason but chiefly for strategic reasons, the Soviet Union has recently announced intentions of active participation in the affairs of Svalbard.

Tromsø is headquarters for Svalbard trade and the port from whence tourist boats leave for summer excursions to the islands. This trip is the easiest way for an ordinary person to reach extremely high latitudes, to see a "High Arctic" region, and to view icecaps of considerable size,

11: Low Countries

The Netherlands and Belgium are the gift of the Rhine, Meuse, and Schelde much in the way that Egypt is the gift of the Nile. Deltas are commonly strategic places endowed richly with agricultural and commercial advantages. The compound delta tract across the North Sea from England is particularly favored. Climatic and soil conditions permit a dense agricultural population. Accessibility has favored commercial leadership. Hinterlands with pasturage, forests, and mineral resources have provided raw materials for the rise of industry, especially in Belgium. Though extremely restricted in size, the Low Countries rank high among nations in world significance.

PHYSICAL BACKGROUND

A typical section across the Netherlands traverses several well-defined belts of contrasting territory. The North Sea coast is comparatively smooth. Broad, sandy beach leads to irregular dunes, generally about thirty feet high, but in a few places up to six times that height. Strong sea breezes formerly shifted these dunes about and moved them generally eastward. They are now fixed by covers of grass and forest to provide excellent shelter for houses and villages. The beach and dune belt has considerable habitational and recreational value.

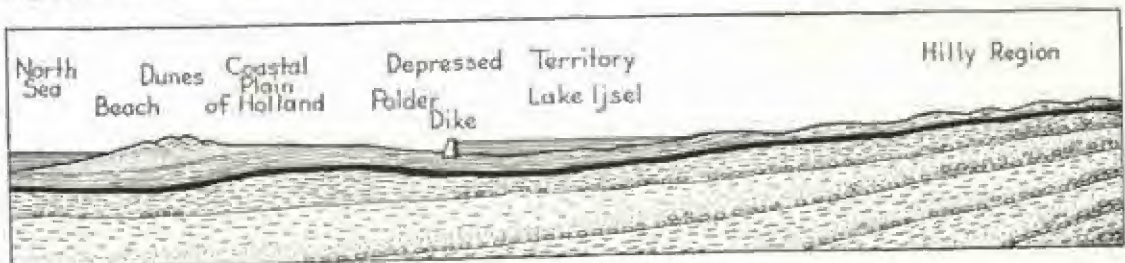
Behind the dune belt is a strip of dry land. By standards of other countries it is low, coastal plain, but for the Netherlands it is high and firm. Here are many of the leading towns and cities, such as Alkmaar, Haarlem, The Hague ('s Gravenhage), Leiden, and Delft. This is the nucleus of

Holland, a term often used to designate the Netherlands as a whole because it is the most significant part of that country. Soils near the dunes are quite sandy. To the east, elevations drop and soils become increasingly clayey. There is a downslope transition from excellent agricultural to pasture land and, finally, to low marshes and bodies of open water.

The main slope of Holland is toward a belt of depressed territory that culminates in Lake IJssel (Issel; formerly *Zuider Zee*). Altogether about one quarter of the land surface of the Netherlands is below sea level, and a considerably larger proportion below the level of high tides. Much of this territory has been made useful by a conversion into *polders*—enclosures surrounded by dikes and drained by pumps.

To the east of Lake IJssel is a higher region, which resembles much of Jutland. The topography is rolling and morainal. Large sandy and gravelly areas are of little use except for pasturage. Bogs and low places contain deposits of peat. In the extreme southeast are high, well-drained terrace deposits and the old-rock margin of a plateau. At depth lie the coal deposits of Limburg.

Belgium is similar, but more diversified. The coastal belt is short (62 miles) and narrow. From the sea to the inner margin of the polder belt the distance is hardly ten miles. Very little land is below sea level and the uplands are more useful. Toward the east is the relatively barren *Campine*, corresponding to the sandy and gravelly lands of the eastern Netherlands, but west of it lies a broad agricultural belt of rolling lands dissected by small tributaries of the Schelde. In the south-



Geologic section through the Netherlands

east the Ardennes Plateau rises to elevations as high as 2,000 feet. Many valleys cut the plateau. Upland pastures flank their forested slopes.

Belgium has not only the equivalent of each topographic belt of the Netherlands but also some that are similar to old-rock parts of England. The lower territory is the equivalent of the young rocks of London Basin. Toward the south are the equivalents of the English chalk and oolitic escarpments. Still farther is a belt where coal outcrops. The valleys of the Sambre and Meuse indicate the direction of the coal belt and are followed by Belgium's industrial region. The Ardennes itself contains rocks resembling those of the Pennines and is similarly endowed with limited supplies of metal ores.

CULTURE BACKGROUND

Celtic and Germanic tribes, such as the Belgae, were occupying most of the Low Countries at the time of the Roman Conquest. These peoples felt Nordic pressure from the north and northeast. Germanic-speaking Frisians appeared at an early date along the coasts and moved into Holland. The main Nordic invasions occurred later, after the Romans left.

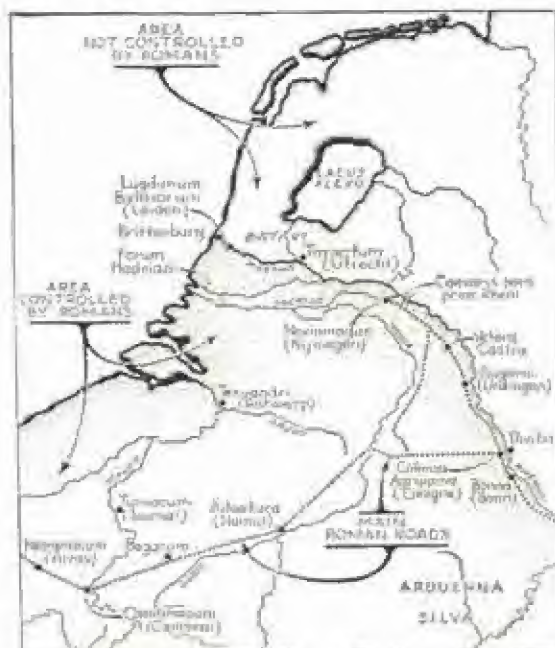
Roman legions were unprepared to cope with the physical conditions they encountered in the main lowlands of the Netherlands. They pro-

ceeded along the Rhine in the direction of the North Sea on crests of land that rose above the immediate sides of the main river and its most important seaward branches. These low ridges, composed of alluvium, stood only slightly higher than nearby marshes, but they were relatively dry and firm. Roman settlers avoided the marshes. Their villages lay only along the immediate sides of stream channels. Brittenburg was established as a Roman fort at the main mouth of the Rhine. Its site was about a mile west of the present town of Katwijk, not far north of The Hague, in a place that has by now been lost to wave erosion. Utrecht, on the channel leading to Brittenburg, was a site of considerable importance near the place where the Rhine left high, dry territory and started across the marshes. Floors of Roman buildings have been excavated here at a depth of about fifteen feet. Utrecht now stands just at sea level, and the Roman floors may be presumed to have had about the same elevation, so their present depth is a measure of the subsidence the whole region has undergone in some fifteen centuries. All delta lands are slowly sinking.

Roman control of the Low Countries lasted for about five centuries. It was most positive in Belgium because good roads were established from nearby points in France. The Rhine settlements in the Netherlands were along the Roman frontier in territory that was not so firmly held. Romans introduced law and order and established towns connected by roads, as they did in England.

Nordic pressure increased as the Romans withdrew. With the appearance of Germanic tribes came the beginning of feudal conditions. By the ninth century land was divided into counties and duchies under Teutonic rulers. Alpines were driven into remote places in the marshes or into the uplands to the southeast. Saxons marched down the Rhine, but Frisians, from the northern coast, became the most powerful group of all.

The Frisian count Dirk III established a stronghold at Dordrecht in 1018. The Rhine had shifted courses and opened a new group of North Sea mouths since the days of the Roman occupation. Utrecht and Brittenburg were on a course that no longer had much consequence, known as the "Old Rhine" today. The Waal had become a principal Rhine mouth, and Dordrecht controlled both it and the Maas or lower channel of the Meuse. Dordrecht thus could take charge of trade with Cologne, Aachen, Liège, and other important upstream points. When Dirk III started levying tolls on all passing commerce, the Bishop of Utrecht, the Archbishop of Cologne, and the German Emperor Henry II found the Frisian count's stronghold in low, marshy country too well pro-



Low Countries: Roman times

tected to stop the practice. Nor was Henry III any more successful against Dirk IV in 1047. Dordrecht became headquarters of the counts of Holland, who prospered so well from control of Rhine and Meuse trade that they extended their power northward along the coast, establishing the cradle area of Dutch culture.

During the Middle Ages the Dutch developed not only wide commercial interests but many industrial skills as well. They spread southward into Flanders.

Flemish people in western and northern Belgium gained an extremely favorable reputation for their textiles. This resulted in considerable trade with England. Bruges became important as capital of Flanders during the twelfth century and for about three centuries ranked as Europe's most important center of cloth manufacturing. Located in former Roman territory, it retained contacts with many places to the south after the Romans left. Bruges also lies near the coast and about opposite to the Thames. It benefited from difficulties that plagued Dordrecht, such as floods, shifting of channels, and unexpected shoaling at various points. When the little River Zwijs proved insufficient to serve as the port for Bruges, it was supplemented by a system of canals. By the fourteenth century, Bruges had indeed become the "Venice of the North," a distinction ordinarily accorded Stockholm during recent years.

Ghent, a short distance inland, rose with Bruges. Its chief concern was with Rhine trade, which was developed along easy overland routes that bypassed Dordrecht and avoided Rhine-mouth troubles. For over two centuries Ghent fairly monopolized commerce between central Europe and the North Sea. Bruges and Ghent were connected by a canal in the middle of the thirteenth century. The prosperity of these early Belgian centers declined, however, when their small rivers shoaled and trade was deflected to other routes. By the end of the fifteenth century their greatness was pretty well a thing of the past.

Antwerp, on the Schelde, became a more important trade center than Bruges in about the middle of the fifteenth century. Wool from England, the Ardennes, and Levantine shores of the Mediterranean was the most important import. Antwerp served Brussels, a short distance inland, and rose as it became the industrial hearth of central Belgium.

The decline of Bruges favored the Dutch, who held the low islands of Zeeland, astride Schelde channels. Tolls were collected on all Schelde trade, a practice that was ended only in 1863 by the purchase of Dutch rights.

In 1433 the County of Holland became incor-

porated in the House of Burgundy, so that political control of the Netherlands passed into Spanish hands. This had little effect on Dutch commerce. Hollanders, first from Dordrecht and later from other ports, were making rapid strides. Failure of herrings to appear in The Sound and the declining power of Lübeck shifted fishing generally into the North Sea, thus giving the Dutch not only a chance to engage in it directly but also to supply countries to the north with salt. This important commodity had long been monopolized by Lübeck, but the Dutch found a source in Brittany, where salt was made by evaporating sea water.

Dutch Baltic trade increased as Hanse power declined. During the sixteenth century over half of all ships passing through The Sound were of Dutch registry. Denmark's tolls incited the Dutch to help King Gustavus of Sweden make Göteborg a great port. Some trade was even established with Russian outposts around North Cape.

Dutch commerce was also stimulated by the fact that forests around the shores of the Mediterranean were becoming so depleted that they could no longer provide timbers for ships and other needs. Dutch ships began carrying timber of Norwegian origin to ports in western and southern Europe.

The greatest stimulus to Dutch trade, however, followed the arrival of the first cargo of spices at Lisbon, in 1503, via Cape of Good Hope. Dutch merchants promptly became distributors of Lisbon goods to peoples in northwestern Europe. After Spain incorporated Portugal, from 1580 to 1640, Portuguese commerce was practically wrecked, so the Dutch gladly took over and carried goods from the Far East in their own ships.

The year 1579 is possibly the most important in Dutch history, for it brought independence of the seven northern provinces of the Netherlands from Philip II of Spain. Secession was proclaimed on religious grounds. The new government immediately adopted a policy of religious toleration. Jews, Protestants from many lands, and others who felt persecuted flocked to Holland. The immigrants brought many skills. Holland soon became the greatest commercial power in Europe.

The Dutch East India Company was founded in 1602. By 1640 the Portuguese had vanished from the seas and the Dutch were dominant in East Indian trade, laying foundations for their colonial empire. Within a century after gaining independence, the Dutch had trading posts in New York, Curaçao, Guiana, Cape of Good Hope, Ceylon, Malacca, Java, Sumatra, and various islands

in the East Indies. Between 1600 and 1750, the Dutch financed Swedish iron and copper mining. Rhine trade was almost wholly in their hands.

Belgium, on the other hand, was slow to prosper. It passed from Spain to Austria in 1713, became part of revolutionary France, and after the fall of Napoleon, was merged with the Dutch provinces. Independence was not gained until 1831-1839. Lying across favored routes between Germany and France, Belgium had the misfortune of becoming the "Battleground of Europe," and the scene of such important conflicts as Waterloo, Ramillies, the invasion of 1914, and that of 1940. The disadvantages of foreign control and late rise of nationalism are still reflected by its limited colonial power. While Dutch colonies occupy 60 times the area and have 6 times the population of the home country, the sole possession of Belgium is a chunk of equatorial Africa. The Belgian Congo came into the hands of King Leopold II in 1885 and was annexed by Belgium in 1908.

PEOPLES

In spite of their small size, the Low Countries are inhabited by peoples who exhibit consider-



Low Countries: linguistic map

able racial mixing, sharp linguistic contrasts, and a strong religious division.

Nordic stock predominates in both the Netherlands and Belgium, but an Alpine element dominates southeastern Belgium, and a considerable Mediterranean influx occurred during the Spanish period, adding to an element which had been present for many centuries.

Nationalism depended originally on religious contrasts, and the political boundary today is fairly close to that of 1579. The Netherlands is predominantly Protestant, while Belgium is almost totally Roman Catholic.

Within the Netherlands the main linguistic contrast lies between Frisian-speaking people and Dutch. The former language, an older Germanic tongue, is spoken mainly by the inhabitants of islands along the north coast and over a rather wide area east of Lake IJssel, while Dutch is the dominant language of the country. Dutch is a comparatively new language and an offshoot of Flemish, the Germanic tongue spoken in northern Belgium.

Belgium is crossed by the boundary between Germanic and Romanic language distribution, a line passing about east-west through Brussels. Flemish is spoken to the north and Walloon to the south. Flemish is about as old as English and developed in the lowlands around Bruges and Ghent. It spread northward across Zeeland into Holland, where it replaced Frisian. The accentuation of certain dialectical differences produced Dutch. The ascendancy of Dutch over Flemish may be attributed to two principal causes: the appearance of a translation of the Bible in Dutch well prior to a translation in Flemish, and the more rapid rise of the Hollanders commercially. Walloon is a variant of French. Walloon-speaking peoples have considerably more Alpine blood than the Flemish. The Flemish, in general, are the agriculturalists and commercial people of northern Belgium, while the Walloon-speaking people are the industrialists and inhabitants of higher territory to the south. Urban centers tend more and more to speak excellent French.

An additional, but slight, linguistic complication arises from the fact that the eastern boundaries of both countries are so drawn that a fringe of German-speaking people is included.

Walloons dominate the economic and political life of Belgium and their tongue is the official language of the country. Most Flemish-speaking people are at least bilingual and practically all place names have separate designations in the two tongues. Antwerp, for example, is strictly an English name. In Flemish it is Antwerpen and in Walloon it is Anvers. Brussels is really either

Brussel (Flemish) or Bruxelles (Walloon), Ghent (English) is Gent (Flemish) or Gand (Walloon). The Flemish Brugge, Luik, and Ieper are better known under their Walloon names, Bruges, Liège, and Ypres.

RECLAMATION

Traditionally the Dutch have depended on the sea for security. Their cradle area, the coastal belt between the mouth of the Rhine and the Frisian Islands (Hook to Helder), had the protection of the North Sea on one side and of low marshes or open inland waters on the other.

As the Dutch increased in numbers it became necessary to expand down the almost imperceptible slopes toward the central depressed area and to reclaim much of their country.

The depressed area was not as low in ancient times. Marshes there were and they balked Roman legions, but old accounts indicate that Lake Flevo, the center of low territory north of the Rhine, was small. A history of flooding, increasing in severity with the passage of time, dates from about the fourth century. The Frisian Islands were large and high in comparison with their present condition.

Regional subsidence, or lowering of land elevation in relation to sea level, was certainly active during the Middle Ages. Streets and buildings of old Roman Utrecht were being lowered at least at a rate of one foot per century. Alluvium from the Rhine was meanwhile being deposited, so that people continued to occupy the site. Possibly no one was aware of the subsidence. New buildings were erected on surfaces only slightly above those occupied by older structures. More positive were the lowering effects in the eyes of Frisian Islanders. With Rhine courses shifting southward, their islands were deprived of the renewing effects of affluvia. They became smaller, both as a result of wave erosion and of general subsidence. Wet marshes appeared where dry land had been. The sea gradually overtook the marshes. Houses rose on stilts, while cattle learned to graze on lands uncovered at low tide.

In the thirteenth century waves of the North Sea first broke through gaps between Frisian Islands and across low marshes into Lake Flevo. Erosion was rapid in the marshes. In about 200 years Lake Flevo had been converted into Zuider Zee, with an area approximating that of recent years. Only since the fifteenth century was the central depressed area so low that the Hollanders had true "protection" of sea to the east of them. Frisian counts had utilized Rhine delta marshes for defense. About the time when the Dutch began to attain commercial prominence, coastal

Holland became a region beyond the limits of easy invasion.

The earliest dikes, or ridges of earth erected for the purpose of holding back flood waters or the sea itself, date from Gallo-Roman times. They were local affairs, around individual towns, and their purpose was to prevent overflow during high tides and storms. It was not until the fifteenth century that diking became general in eastern Holland. Since dikes keep water in as well as out, the diked lands had to be drained by ditches and ditches had to be emptied by pumping. Windmills began appearing in the Dutch landscape in the twelfth century and became quite general by the fourteenth. Their main purpose was to supply power for pumping.

Diking for reclamation of agricultural land, rather than simply for protection, started in the fifteenth century when prosperity resulted in increasing population. As the Dutch progressed eastward toward Zuider Zee, the enclosed lands became lower, the dikes higher, and the system of drainage and pumping more complex. Eventually about 40 per cent of the Netherlands was to become polder land enclosed by dikes. Cultural landscapes were revolutionized.

Canals between fields within polders are used both as fences and local roads. Farmers commonly use small boats in going to and from daily chores in fields and for hauling crops to barns or local markets. If the distance from village home to field is great, the first overland leg may be by bicycle which is likely to be loaded into a boat and taken to the field. Dikes rise above the strips and checkerboards of polder fields, which are sharply differentiated not only by local ditches but by contrasts arising from land use under a strict system of crop rotation involving pasturage of black-and-white Holstein cattle. Behind the dikes are high-level canals conducting water to the sea. Within the dikes are the polder canals and ditches leading to sumps, from which water is pumped to the higher drains. Many windmills have been needed for the task and many remain, but today an increasing amount of the pumping depends on engines. The high-level canals lead to the sea through lock systems that prevent flooding at times of storm or high tide.

Road patterns are dictated by dike directions. Houses are grouped in strings along the roads and high-level canals, picturesque not only because of their setting but also because of their distinctive architecture. Fancy, false fronts rise along the roads, behind which are one-story dwellings with white walls and red roofs. Brick

is the universal building material and tile the universal covering. Both are manufactured from local silts. Rows of trees flank the polder canals, serving as windbreaks in a territory where winds are steady and strong enough to have been utilized so widely as a source of power.

The most ambitious reclamation project was begun in 1927 and will result eventually in adding 800 square miles of useful land, or about one sixteenth of the area of the Netherlands. A dike was run across the entrance of the Zuider Zee converting it into an inland lake, Lake IJssel. This lake will become reduced in area as new polders are built. The added land will grow food enough to support 300,000 people. Reduction in the size of Lake IJssel, however, will terminate the livelihood of some 6,300 fishermen, who support about 15,000 people. These are being encouraged either to migrate to the North Sea coast, where new fishing villages are being built, or to become farmers in the polders.

The traditional protection of Holland failed to prevent German invasion in World War II. Dikes were cut and polders flooded, but incursions of saline waters had comparatively little bad effect on the land. With the end of the war,

the Dutch went to work promptly and vigorously. Dikes were repaired and polders drained, with the result that the crop yield in 1946 was about 60 per cent of that normal in prewar years.

In spite of the scope and importance of the Lake IJssel project, the most rapid gains in agricultural population density during recent years have occurred in eastern Netherlands, where relatively poor soils are being fertilized and converted into reasonably good lands. This development is parallel to the gains that the Danes have been making in the poorer parts of Jutland.

INDUSTRIAL AND COMMERCIAL DEVELOPMENTS

The Industrial Revolution found the Netherlands without coal or other sufficient sources of power. Windmills, long used not only for pumping but also for grinding flour and small-scale manufacturing, could not compete with engines. Not only was coal lacking, but so were extensive forests. From industrial leadership in the seventeenth century, a decline relative to England, France, and Belgium reduced the Netherlands to comparatively low industrial standing. A small country that had built four great universities—Leyden (1575), Utrecht (1636), Groningen (1614), and Amsterdam (1632)—and had established trading posts and colonies in all parts of the world, faced severe handicaps during the period that witnessed the rise of large factories in other lands. The universities and the colonies have been retained, however, because the Dutch turned with vigor to intensive agricultural development, greater emphasis on commerce, careful development of such meager resources as the homeland possessed, and specialization in products of its colonial empire. Today the Dutch retain high rank in all major lines of endeavor, except heavy industry.

Amsterdam, as a result of location near the mouths of the Rhine, and as a result of river, canal, and harbor development, rose to become the largest and most active port on the Rhine Delta in the seventeenth century. Its population advantage has been maintained ever since. Increase in size of ships rendered its Zuider Zee location disadvantageous, but this handicap has been offset to a large degree by the dredging of a deep, North Sea Canal, westward to IJmuiden. Like London, the city retains supremacy in colonial trade, and still handles 40 per cent of Dutch imports.

Rotterdam, on the New Mass, with waterway connections that in earlier centuries had made the rise of Dordrecht possible, gradually passed Amsterdam commercially, to become the busiest port



Low Countries: Index map

on the European mainland. More recently this distinction passed first to Antwerp and later to Hamburg. A canal to the North Sea, the New Waterway, overcame the difficulty of shoaling channels, permitting port development to the point where the city handles 75 per cent of Dutch foreign trade and is a main entrepôt for goods going to Germany and other mainland points. It is also the main foreign outlet for products of German manufacture. Being closer to the Thames than Amsterdam, it carries on most of the "ferry trade" with England, in spite of the fact that the fastest steamers to Harwich and Hull leave from Vlissingen (Flushing), in southwestern Zeeland, and from The Hook (Hoek van Holland), on the coast about seventeen miles west of Rotterdam.

The per capita foreign trade of the Netherlands is second only to that of Denmark and among all nations the total foreign trade ranks fifth. The normal rank of the Dutch merchant marine is seventh among nations. On a per capita basis it is exceeded only by the Danes and Norwegians. Ship repairing and building centers arose along the Rhine and Meuse, in spite of lack of iron and steel.

The inland communications system has taken the form of 3,000 miles of roads, 2,250 miles of railroads, and 4,660 miles of canals; remarkably different ratios than exist in other countries. Rotterdam is general headquarters for most of the canal trade, being the place where goods are transferred between ships and barges. Dutch barges not only convey goods generally throughout the Netherlands but also up the Rhine, Meuse, and other streams, beyond national boundaries. The importance of barging is shown by the fact that 1 per cent of the entire population is resident on these useful, shallow-bottomed carriers.

The commercial progress of the Dutch has been supported by a substantial agricultural program at home. About two thirds of the land area of the Netherlands is under cultivation or in pasture. Rye and oats are rivals for first place among crops, followed by wheat, barley, flax, sugar beets, and potatoes. No other country has such great density of cattle, and only Denmark exceeds it in horses and pigs. World War II upset many of these conditions but the dislodgements are not likely to persist for long. The Germans took very few farm animals from the Danes, but they made heavy inroads on the Dutch. They were careful, however, to leave a nucleus of good breeding stock, even in the Netherlands.

Although the number of persons engaged in agriculture has declined according to northwestern European pattern, it still remains at about 20 per cent of the population. Farms are small, over

half occupying less than 12 acres. Cultivation is by means of the hoe rather than the plow or tractor, but this implement is not the primitive hoe of the African World. It is that of the horticulturalist, who gives attention to each individual plant. An amazing area is covered by glass, or by lath. No other nation uses as much fertilizer per acre of cultivated land. Truck gardens cover about 3.3 per cent of the whole country, much of the product being exported to England and Germany.

In spite of intensified farming, about one quarter of the imports are foodstuffs. Population has increased at a rate of about 100,000 a year. The increase amounted to 200 per cent between 1829 and 1930, attaining 10.3 million in 1951. Much of the cultivated land produces expensive flowers and bulbs, rather than low-cost food. This great industry centers in the sandy lands of Holland, with centers at Haarlem and Alkmaar.

Forest covers but 7 per cent of the Netherlands. The largest groves of trees occur on the dunes along the coast. Only a few remnants of once extensive deciduous forests are left in the eastern part of the country. Practically all lumber is imported, so it is used as little as possible.

INDUSTRIAL REVOLUTION

Though the Netherlands was dealt a severe blow by the rise of industry in other countries and was slow to become industrialized, about 40 per cent of the population now depends directly on manufacturing for livelihood. Industry has developed in three main directions: (1) agricultural, (2) the processing of colonial products, and (3) the making of goods that require a high degree of skill and labor, rather than bulky raw materials.

Butter and cheese making stand foremost among agricultural manufacturing, especially around the margins of the depressed area and in the eastern part of the country. The closely related margarine industry started on the basis of animal fats, but later turned to oils of tropical plants, such as peanuts. Enough sugar is refined, from local beets and tropical cane, to yield a surplus for export. Distilleries dot the landscape, nearly 300 operating in Amsterdam alone. These make commercial alcohol from potatoes, and Holland gin from rye. Rotterdam and other centers have breweries, which use barley and other grains.

Concentration on colonial imports has made Amsterdam and other Dutch cities important as manufacturing centers of cocoa, chocolate, cigarettes, cigars, soap and other products requiring

fat as a base, and a great variety of East Indian specialties.

From South Africa came diamonds in their completely unattractive raw state to be cut and polished into brilliant stones. It is always easy to polish something when a harder abrasive is available, but diamond is the hardest thing on earth, the best possible abrasive itself, and therefore the most difficult thing to polish. To primitive people the diamond has little value as a gem. The great gem of antiquity was amber, soft and easy to cut and polish. Diamond can be cut or polished only by diamond and the techniques involved are extremely difficult to master. They were developed in Amsterdam, which until 1940 maintained a tight monopoly over the industry. Fearing German occupation, many of the craftsmen were moved to New York, because their skill was considered too important for the world to risk. Though comparatively few people were involved, the value of diamond processing in the Netherlands prior to 1940 ranked second only to textile manufacturing. After the termination of World War II, some of the diamond craftsmen returned to Amsterdam, some remained in New York, while a few went to Palestine. There are now three main centers of diamond cutting. A fourth center is developing in Brazil. The monopoly of Amsterdam appears to have been a war casualty.

Among other products requiring great skill are certain types of weaving, objects of art, various kinds of tile and pottery, and many minor items, such as shoes, electrical equipment, machinery, and chemicals.

The textile industry is widely scattered. Utrecht and Tilburg specialize in linens. Tilburg is also the main woolens center. Rayon is made near Breda. Cotton industry is centered in the east along the German border to the north of the Rhine. Leather industries are nearby. Delft, Gouda, and other places have long been famous for ceramic wares. Eindhoven became an important center for radio supplies and other electrical goods.

Within recent years it has been discovered that valuable coal deposits exist at workable depth in the province of Limburg in the extreme southeast. Heerlen, the chief coal-mining center has increased in population from 5,000 in 1900 to about 50,000 today. An extremely progressive plan for development has resulted in production of 90 per cent of the coal needed at home. Miners live in attractive houses quite unlike the squalid structures they inhabit in England and most other coal-producing countries. Maastricht and other cities are starting to resemble the Belgian indus-

trial centers that extend westward along the shallower continuation of the same coal beds.

URBANIZATION

Though the average population density approaches 700 per square mile in the Netherlands, there are only three cities of any great size and only half a dozen with population in excess of 100,000.

Amsterdam began to change from an obscure fishing village to a commercial port during Hanseatic times, and although it has long been the most populous city of the Rhine Delta its population was only 200,000 as late as 1880. Since then it has grown at an amazing rate to nearly 851,000. Nearby Leiden, with somewhat better location, on an old Rhine mouth, and originally more important, has a population of but 70,000. Rotterdam has grown to nearly 700,000 and The Hague to over 570,000, mainly during the last century. Utrecht, a central trading city on crossroads between east-west and north-south lines of communication, has a population of 197,000. Haarlem now has a population in excess of 165,000 and six other cities have climbed to well over 100,000.

Only about one fifth of the population is accounted for by all these cities, a degree of urbanization extremely small in comparison with that of England, Scotland, Sweden, or Denmark. This small degree is a result of industrialization in minor centers and also an indication of the denseness of rural population.

BELGIAN FLANDERS

The northern plain of Belgium resembles the Netherlands closely. Its Flemish population took to the sea readily, caught fish and turned to oyster raising. They also tilled the land intensively and took an early lead in textile manufacturing, art, and architecture. The low, sandy coast had an advantage of proximity to England in the days when the latter exported wool to be washed, spun, and woven on the continent. Thus, the Flemish cities of Bruges, Ghent, and Ypres became the leading commercial centers of northwestern Europe toward the end of the Middle Ages. Flemish Antwerp attained special greatness as a Hanseatic depot and, until recently, was the busiest port on the European mainland. Though passed by Rotterdam and Hamburg, it still carries on more trade than Germany's second port, Bremen. From Flanders came many skills and a language to the Dutch. It also supplied artisans who taught the English to manufacture their own textiles.

The coast of Flanders is sandy and straight. Nieuport, Ostend, Blankenberghe, Zeebrugge, and other small towns are of little consequence except as resorts and termini for small steamers from

England. Swimming is enjoyed along the broad beaches by English on holidays.

Behind coastal dunes is a narrow strip that has become a horticultural region corresponding to the flower- and bulb-growing district of the Netherlands. Here truck crops are raised, in part for English markets, as well as bulbs to be sent still farther abroad. In pastures graze fine Belgian draft horses and other animals.

The main agricultural belt lies to the south of the pasture lands on gently rolling hills. Here is an extremely dense rural population on farms that average only four acres in size. Yields are enormous, the principal crops being sugar beets, potatoes, rye, wheat, oats, barley, flax, and tobacco. The most productive lands are in the Schelde basin, along low valleys that converge toward Antwerp. Though Belgium is highly industrialized, only 20 per cent of its imports are foodstuffs, thanks largely to the industry of Flemish farmers.

Breweries, distilleries, sugar refineries, and other factories for processing the products of agriculture dot the landscape.

Most textile manufacturing is in Flemish hands. Specializing in woolens and linens, the mills of Ghent, Tournai (Doornik), and Courtrai (Kortryk) turn out 15 per cent of the value of Belgian exports. Wool is imported from all parts of the world, much in unwashed condition. It is exported both as washed wool and as cloth. Much Belgian flax goes to England, but Belgian mills import supplies from the Soviet Union and eastern Baltic territory. Pure water in the streams of western Belgium is particularly desirable for retting flax and has much to do with localization of the linen industry. Skilled artisans specialize in such expensive items as tapestries, lace, and carpets. Cotton is a minor item, but it is imported from the United States, Egypt, and Brazil.

Both of Belgium's great cities lie in its Flemish part, although Brussels, the capital, is practically on the linguistic boundary and is Walloon speaking.

Antwerp, the older great city, still has the Hansard trade interests of the Germanic people who brought it to prominence during the fifteenth century. Its busy port is supplemented by distilleries, flour mills, sugar refineries, tanneries, and mills for processing imported goods. It has prospered as a distributing center for Congo imports starting with ivory, later rubber and diamonds, and more currently, oils, copper, radium, and other minerals. An impressive population increase to 795,000 was paralleled by enlargement of its excellent artificial harbor.

Brussels, on the Senné, a branch of the Schelde, is a port in the Manchester sense—by grace of a canal from Antwerp. It has grown not only for

political reasons but also as a manufacturing city for textiles, furniture, art and luxury wares, paper, and other items. Its population now exceeds 1.3 million and forms a gigantic outpost of French-speaking people in Flemish territory. The city is the hub of a railway network denser than that of any other nation. Belgium has more than one half mile of track for every square mile of its area.

Ghent, one of the three other Belgian cities with population in excess of 400,000 is strictly Flemish. It is the chief center of the weaving industry. Raw cotton reaches it through the Terneuzen Canal, a fact that has localized over half of all Belgian cotton spindles in its vicinity.

The Campine, east of Antwerp, originally contained large areas of sandy waste, rocky ground, heath, and marsh, which were long unuseful. Considerable progress toward rendering these lands productive, and the discovery of coal at depth, as in Dutch Limburg, has turned eyes toward this region and many expect it to become the site of important industrial activity.

SOUTHERN BELGIUM

Southern Belgium exhibits far more than linguistic contrast to Flanders. Landscapes change completely. Traveling across Flanders one can well imagine that he is in the Netherlands, but south of Brussels he is likely to feel that he is in some highly industrialized part of France. Architectural contrasts are extreme, especially in such details as the appearance of modest homes and villages. New crops are encountered. Factory chimneys become more abundant, and large areas exhibit unsightly pyramids of mine refuse. In the narrow strip between the chalk and the ancient rocks of the Ardennes, along the valleys of the Sambre and Meuse, lies one of Europe's most highly industrialized areas. Still further are the uplands of the Ardennes with their many deep valleys.

The Walloon population of southern Belgium started mining coal and metals in the fourteenth century. They share with peoples of Manchester, Birmingham, and other English centers credit for having initiated the Industrial Revolution. Liège became an important smelting center before the Black Country had lost its forests. Though the Meuse Valley has long been famous for fruit, and the vine appears on some southward slopes in southern Belgium, the main interests are industrial. Agriculture and trade are subordinate.

Liège developed on the basis of local coal deposits, which were in proximity to iron, lead, and

zinc of the Ardennes. Nearby Verviers is still the leading zinc smelter of Europe, and industrial Aachen is not far away, less than 25 miles, but across the German border. West of Liège is a belt of industrial cities, such as Namur, Charleroi, and Mons, as well as a host of smaller centers.

Fuel became increasingly expensive as mines reached greater depths. Some went below 3,000 feet. Ardennes metal ores failed to meet the demand. The coking quality of Belgian coal was rather poor. Such handicaps might prevent the establishment of a new industrial region today, but they are rather inconsequential after a "hive of industry" is thoroughly under way. Resources were ample when industrialization started. Tradition and the presence of skilled workers have kept it going. Metals could be imported from other lands, and excellent coal could be obtained from the nearby German Ruhr. Imports increased costs, but like Birmingham and Sheffield, the Belgian industrial hive turned to making more expensive wares, such as instruments, guns, hardware, and machinery. About three quarters of the product is exported.

Pottery making, cement manufacturing, and glass industries are other important sources of Belgian income. Belgian glass blowers have taken their skills to other parts of the world to such an extent that it has almost become redundant to mention nationality in connection with the occupation.

Though the Ardennes has furnished metals to Belgian industry, it is rural and quite unlike other parts of the Low Countries. Picturesque valleys and forested slopes have scenic value that has attracted many visitors, making Dinant and other places resorts. Toward the north there is considerable agriculture, but southward a scant population is concerned mainly with grazing of sheep. The proportion of forest is small, but some lumbering is still in progress.

POPULATION DENSITY

Industrial and agricultural Belgium is somewhat more densely populated than commercial and agricultural Netherlands. Its more-than-700-per-square-mile density is exceeded in certain parts of rural Saxony, the Po Valley, and the Channel Islands but only by one other whole nation in Europe—England with 843. Only one national or political unit outside of Europe has greater density, Java. Some 8.7 million Belgians are crowded into 11,775 square miles. Dutch population density is almost as great, with 10.3

million in an area of 14,450 square miles. Either country is smaller than Connecticut and Massachusetts combined—13,266 square miles.

LUXEMBOURG

In the interval between the Treaty of Verdun in 843, and that of Mersen in 870, Lotharingia, or Middle Kingdom of Europe, was a state extending northward from the Rhone Valley to Friesland. This "route state" separated French and Germans but included large numbers of both. Though names have changed and political boundaries have shifted back and forth, the territory of old Lotharingia has remained more or less of a buffer between a large Germanic population to the east and a large French population to the west.

The experiences and history of peoples in Lotharingian territory do not excite envy. Alsace, Lorraine, Saar, and other parts of the belt have had extremely unhappy political experiences. Switzerland alone has been peaceful and prosperous for a long time. It succeeded in resisting Hapsburg aggression, the beginnings of its political confederation dating from 1291. Among the residual descendants of the old Middle Kingdom is Luxembourg which, though not part of the Low Countries physically, except in resemblance to the Ardennes and its margins, is so closely allied with Belgium commercially that it should be considered in this chapter.

Luxembourg has an area of 999 square miles, which is about 80 per cent that of Rhode Island. Half of it lies in the Ardennes and half in the Lorraine Plateau, being divided by the valley of the Sauer (Sure) and its tributaries. Some 460 square miles of cultivated land lie along these tributaries of the Moselle. Pears, apples, and plums grow in attractive orchards. Vineyards flank many slopes. Barley, oats, sugar beets, and potatoes are produced along the floodplain flats. About one third of the population is agricultural.

The real importance of the independent Duchy lies in industry. Esch, its mining center, shares the iron deposits that have made Lorraine so prized by German and French neighbors. The production of pig iron and steel is enormous for a country of only 300,000 inhabitants. In 1922 Luxembourg was united with Belgium in a customs union, so that no trade barrier existed along their common boundary. This union was dissolved in 1940 when Germans occupied the Duchy. After World War II a commercial agreement united it with both Belgium and the Netherlands. Unsettled currency values, however, have retarded most potential advantages of this Benelux project.

12: Germany: Physical and Cultural Background

Germans have always distinguished between *Deutsches Reich*, or Germany in the political sense as defined by boundaries, and *Deutschland*, a larger territory in the central part of Europe, where a considerable part of the population speaks some dialect of German. German geographers speak of this latter region as Central Europe and regard it as including Metz in "German Lorraine," Alsace, and small bits of Belgium and the Netherlands in the west, while eastward limits extend well into Poland, the Baltic States, or even into central Rumania. They run the boundary of *Deutschland* northward so as to include a generous part of Denmark, and southward across the Alps into several valleys in northern Italy and to coastal Yugoslavia. The Saar, Luxembourg, and Austria are included without question. Bohemia is an integral part of the concept and Hungary is likely to be included. Holy Roman Empire tradition lies behind the idea of Central Europe.

The true core of Central Europe approximates Germany of 1938 and upper (western) Austria. This territory is culturally Northwestern Europe in practically all regards. Nordics prevail among the various racial stocks in the north. Alpines become numerous in the south. In view of the curious "Aryan" propaganda of the Nazi period, it should be emphasized that even *Deutsches Reich* itself is the least purely Nordic nation in the Northwestern European culture realm. Northern Germany is predominantly Protestant. Southern Germany is predominantly Roman Catholic. To the east, Central Europe

becomes increasingly complex from the standpoint of cultures, shading off into the Shatter Belt, or zone of political instability between Teuton and Slav. Southward and southwestward it shades off into Mediterranean cultures, in territory that was firmly part of the Roman Empire.

Germany has always lacked definite boundaries. Within recent years it has been surrounded by a dozen or more nations, and some 25 "neighboring peoples" live either across the political lines or narrow seas. In 1919 *Deutsches Reich* lost 27,275 square miles and a population of over 6.5 million. In 1938 it had a total area of 182,741 square miles (about 70 per cent as large as Texas) and population of nearly 70 million (about 50 per cent of the United States). Territorial annexations just prior to World War II increased the area to 246,342 square miles and population to over 84 million. The four occupation zones created at the end of World War II covered about the 1938 area and approximately the same population.

Central position in *peninsular Europe*, the lands between the great Baltic and Mediterranean indentations, gives Germany a handsome trade advan-



Germany, 1950, and *Deutschland*

tage in times of peace but places it in a position of disadvantage in times of war. The European Plain extends without significant interruption from France across northern Germany into the Soviet Union. Highlands and mountains to the south of Germany are crossed by long valleys and easy passes, so that no particular line of summits has ever become an effective cultural boundary. Germans have migrated freely to the southern slopes of the Alps, eastward along the Danube, and westward into various parts of France. Germany has been equally open to attack by peoples proceeding in opposite directions.

Germany has tremendous resources. Its mineral wealth includes some of the finest coal deposits in Europe, practically all kinds of metals, and rich deposits of both common and rare salts. A wide variety of soils and climates permits crops ranging from those of Scandinavia to many that are typical of Mediterranean lands. Germany is just about able to support its dense population by its own agriculture, an unusual thing for a highly industrialized nation. It has extensive forests. River and other communications are excellent.

Climates vary from continental, with long, bleak winters, in the east, to practically maritime types in the west. The Rhine Valley of southwestern Germany has a moderate winter, while summer is warm enough to mature tobacco and deciduous fruits. Annual precipitation is everywhere sufficient for the needs of agriculture and excessive

only in a few highland areas that serve to support forests or relatively good pasture lands.

The most serious drawbacks of Germany have been cultural. It has long lacked ethnic or religious unity and focal points for cultural development. During ancient times Germanic tribes roamed lands beyond the fringes of Mediterranean civilization. The Middle Ages found them divided into the most complex group of warring states the world has ever known. Germany was late to emerge from Medieval traditions and customs. As a modern political and economic power it is among the youngest in Europe. Germans had almost nothing to contribute to the early developments of Europe's Commercial and Industrial revolutions.

TOPOGRAPHIC REGIONS

From the topographic standpoint, the simplest possible divisions of Germany into significant units must recognize: (1) the north German plain, (2) the central belt of uplands, where rocks are typically flat lying, and (3) the southern belt of mountains—eastern Alpine ranges—where rocks are folded.

NORTH GERMAN PLAIN

The north German plain is divisible into three parts: (1) morainal heights, toward the Baltic, (2) the central depression, and (3) the southern foothill zone. Open in either direction, and part



Central Europe:
topographic re-
gions

of the European Plain, this northern part of Germany has served as a wide corridor for migration of plants, animals, and peoples.

Morainal heights culminate in an elevation of nearly 1,100 feet at Thurmberg just west of the Vistula, in a local upland known as the Baltic Heights. From these a more or less continuous belt of highlands flanks the Baltic in an arc that swings westward toward Denmark. This belt marks a long halting stage of the Fennoscandian icecap, during its last major retreat. Stones and surface materials that had been scoured and removed from Sweden and Finland were transported across the Baltic to be deposited as moraines. Meltwater streams issued from the ice front to wash away many finer materials, leaving surface concentrations of stones, gravels, and sands on the moraines.

An examination of any reasonably detailed map will show the presence of hundreds of lakes in the morainal heights territory of Mecklenburg, Pomerania, and East Prussia. These are water-filled basins in irregular morainal surfaces, rather than in ice-scoured depressions such as exist in Svealand. Many low basins have been drained or partially filled by sediment and vegetational debris to become marsh, bog, or meadowland. Some basins contain deposits of peat. The zone of irregular lakes and wet flat areas continues eastward across the Baltic States into the Soviet Union. It is characterized by rather poor land agriculturally, with sterile soils that do little better than produce rye and potatoes, or support livestock. Coniferous forests grow generally on slopes. Population is sparse, and land holdings are large.

The average January temperature at Tilsit, on the Lithuanian border, is 25° F. Many east Baltic ports are closed by ice for as much as two and one-half months; longer intervals occurring where there is relatively fresh water. Memel is closed an average of 142 days per year because the water in its harbor is so fresh. The adjacent Baltic is rarely frozen severely enough to interfere with modern ships more than two weeks per year. Lübeck, near the western end of the German Baltic coast, is open for most of the winter and with the aid of icebreakers serves as an all-year port. Winter rainfall in the west commonly grades into snowfall in the east.

The Oder River is a boundary between the two most distinctive coasts along the morainal heights. To its east, shores are smooth and sandy. Elongate bars, *nehrungs*, tend to extend sandy beaches across entrances to all bays and estuaries. Shallow lagoons, *haffs*, lie isolated behind many *nehrungs*. Offshore waters are shallow and ports exist only at river mouths. West of the Oder, shores are indented by many irregular inlets.

Jörden, and harbors are more plentiful. Many rocky cliffs rise above the Baltic, whereas the characteristic coast to the east exhibits broad beaches and a belt of low sand dunes.

Land west of the Oder is more attractive agriculturally, as it produces a greater variety of cereal crops and more sugar beets. The only place east of the Oder where wheat, beets, and tobacco are grown intensively enough to support a dense agricultural population is the Vistula Delta. Population is fairly dense at several places to the west, estates are smaller, and the percentage of owners who work land is much higher.

The central depression of the north German plain is a broad belt south of the morainal heights extending from Poland to the North Sea coast. Elevations of 500 feet are fairly common, but most of the belt is a lowland between conspicuous hills near the Baltic and the foothills of central Germany. Minor topographic patterns are determined by moraines that are considerably lower than those near the Baltic. Much low, marshy or swampy territory lies between these minor ridges.

Fennoscandian ice reached as far south as the southern border of the central depression. Halting stages were short during the initial retreat of the ice so moraines are small. Lüneburger Heide, Fläming Heights, and Lusatian Heights outline the more conspicuous of these southerly glacial deposits.

Stream patterns in the central depression are almost wholly the product of morainal distribution. Since most of the moraines tend to follow the trend of the south shore of the Baltic, and streams commonly flow along the lowlands between moraines, drainage is deflected to the west by morainal ridges. Many more streams flow into the North Sea than one might expect. To appreciate the significance of this statement one should hold some good atlas map so as to sight along the almost straight line between Gleiwitz, in Upper Silesia, past Breslau, Frankfurt-an-der-Oder, Berlin, and Hamburg.

Agricultural and economic resources are comparatively unimportant in the central depression. Too much land is subject to flooding or in need of drainage. Cities are located mainly at stream bends or on the higher lands along the immediate sides of streams. Posen, Frankfurt-an-der-Oder, and Magdeburg are the chief settlements that are truly old. Berlin, the giant conurbation of the central depression, is a product of comparatively recent favoritism. It attained some commercial importance when the Oder-Spree Canal was constructed, in 1668, but Frankfurt-an-der-Oder re-

maintained a more important meeting place for German and Polish traders until early in the nineteenth century. Having been designated as capital and made a great railroad center, Berlin established industries and commercial activities that culminated during the twentieth century when it became the most populous city in Europe west of the Soviet Union. Berlin carried its Baltic outport (Stettin) along, to outstrip all other German ports along that coast.

The best land in the central depression lies in the extreme west. Crops are more diversified and grow with greater ease. Population density runs higher in rural areas.

The southern foothill zone is by all odds the most important part of the north German plain. Population is densely concentrated in cities and on the excellent soils that flank the central uplands. Three significant units may be recognized along the foothill zone: (1) Silesia, (2) Saxony, and (3) a narrow western belt.

Silesia extends along the Oder Valley and runs upslope into the Sudetes. Its good lowland and terrace soils grow wheat, sugar beets, and other crops that demand much in the way of fertility. Flax and wool centered textile manufacturing in its leading city, Breslau, at an early date. Farther up the Oder, in Upper Silesia, one of Europe's best coal deposits is located near rich bodies of iron, zinc, lead, and other ores. The industrial region resulting from this fortunate combination has suffered within recent years from division among Germany, Poland, and Czechoslovakia, according to terms of the Treaty of Versailles. About one fifth of Germany's normal output of coal came from Upper Silesia. Industrial Gliwicz, Ratibor, Beuthen, and other centers have benefited from construction of the Upper Oder Canal, which extends navigation beyond its natural head at Frankfurt. Silesia is a promontory of Germanic culture that juts into Slavic territory. It stood on the eastern borders of European civilization as recently as the fifteenth century.

Saxony, to the west, lies mainly below the Ore Mountains. It not only has soils as good as those of Silesia, but it also has milder winters. Agricultural productivity is higher and population denser than in any other equivalent area in Europe. A small coalfield between Zwickau and Chemnitz accounts for only about 4 per cent of Germany's output, but it helped localize an industrial region that far outshadows Upper Silesia.

The Ore Mountains (Erz Gebirge) have a long mining tradition. It was here that miners, after many years of excommunication and persecution,

finally won from the Church the right to follow their trade without incurring penalties for willful sinning. The world's first mining school was established at Freiberg. Silver, lead, tin, zinc, iron, and other metals were locally abundant according to the standards of Middle Ages' industrial demands. Many colonists were attracted by such magnificent resources. Mineral wealth was supplemented by rich deposits of potash and other salts at Stassfurt. These became the basis for Germany's chemical industry, which by all odds is first in the world. Even such a humble natural resource as clay was used to good advantage.

Dresden, near the Elbe Gate to Bohemia, became a main route center. The expensive china-ware that bear its name is manufactured in nearby Meissen. Leipzig established a trade fair in 1268 and long competed with nearby Halle for trade with the south and southwest in the Main and Neckar drainage basins. Partially as the result of having established a university in 1409, it became one of the world's greatest publishing centers. Like many another *route town* it has been the scene of notable battles and has suffered much destruction, but location between Berlin and Nürnberg, Dresden and Magdeburg, and proximity to the resources of Saxony destined it to become a tremendous conurbation during the past century.

Silesia and Saxony culturally overlap topographic divisions of central Europe. Silesia extends well into the upper parts of the Sudetes and Saxony to the summits of the Ore Mountains. The main centers of population, of course, lie in the lowlands of the foothill zone. Cultural penetration into the uplands was a natural consequence of broad valleys that extend into the mountains. Silesians and Saxons climbed slopes for resources, in some cases settled, and to some extent overran watersheds.

Zones along which streams leave uplands for plains territory are likely to localize cities. In the United States this is particularly evident between New York and Macon, Georgia. The boundary between the older rocks of the uplands and the younger of the coastal plain has developed many a cascade, rapids, or waterfall that might stand as the head of navigation or become useful in supplying power for processing the products of the flatter territory. Trenton, Philadelphia, Baltimore, Washington, Richmond, Durham, Columbia, Augusta, and many other towns and cities string along this Atlantic "fall-line" belt of the United States. A similar belt in Germany runs from Aachen to Breslau. Many of the cities of Silesia and Saxony have fall-line locations, but the excellent soils, varied resources, and wide valleys upstream from such places would have been suf-

ficient to localize important knots of population even though the fall-line element were lacking. To the west the relative importance of the fall line is greater.

The narrow western belt winds along the foothills of Thuringia and Westphalia to the Eifel. This continuation of the fall line west of Saxony is narrow; the contrast between lowland and upland is sharp, both physically and culturally. The zone of greatest agricultural activity is not wide enough to have developed a population with a characteristic dialect or other culture traits such as unify Silesians or Saxons.

Magdeburg, Brunswick (Braunschweig), and Hannover are great cities along the western foothill belt. Each lies near uplands and opposite at least one important route to the Rhine Valley, Cologne, or other significant place to the south or southwest. Salt deposits, limited amounts of coal, proximity to metal resources, and comparatively good soils help to explain their rise.

UPLANDS

The uplands of central Germany are extremely diversified in topography. Surrounding Bohemia are the well-defined Sudetes, Ore Mountains, and Bohemian Forest, which are distinct ranges with linear summits. To the west are many irregular upland masses separated by wide valleys. All are alike in being composed of rather old, hard rocks, which are relatively unfolded today. In age these rocks resemble those of the Pennines and Ardennes. The uplands practically escaped ice cover during the Ice Age and therefore lack scenic, glacially deepened valleys, conspicuous waterfalls, numerous lakes, or valleys blocked by morainal deposits. Population is concentrated along valley flats. Forested slopes lead to rather broad upland pastures, where soils are poor.

Though it would be easy to double the number and at the same time designate distinctive parts of the uplands, our discussion will recognize 10 main regions: (1) Sudetes, (2) Ore Mountains, (3) Thuringia-Hessia, (4) Rhine Highlands, (5) Rhine Gorge, and (6) Westphalia, all of which may be considered as central Germany; (7) Rhine Valley, (8) Black Forest, (9) Jura, and (10) Alpine Foreland, of southern Germany.

The Sudetes (Riesen Gebirge) to the northeast of Bohemia and southwest of Silesia are moderately scenic, deeply dissected, forested, and sparsely populated mountains, notable as sources of forest products and wool. Schneeberg south of Silesian Glatz is the dividing point between drainage into the North, Baltic, and Black seas. Many towns at lower elevations, particularly on

the Silesian side and toward the Elbe Gate in northern Bohemia, specialize in textiles. Bohemian Gablonz (Jablonec) is a center of over 1,000 glass factories that produce anything from optical lenses to cheap beads. Many places support paper, chemical, and other industries, including iron and steel mills. The Moravian Gate, which is the lowest pass between Danubian basins and Upper Silesia, culminates at an elevation of only about 1,000 feet.

The Ore Mountains (Erz Gebirge) are extremely fortunate in their mineral wealth. In addition to the common metals, there are deposits of uranium, graphite, China clay, an abundance of inferior coal, and lignite (brown coal). The latter is an important local source of electricity and has been the base of a thriving chemical industry in northwestern Bohemia.

Silver mining brought a considerable population to these mountains during the Middle Ages. Towns were located where ore was most plentiful, rather than for other reasons, with a result that some extend into summit locations. With the exhaustion of ore, inhabitants either remained and developed domestic industries or followed the downslope shifting of heavier industrial activity, toward the coal of Chemnitz, Plauen, and Zwickau.

Though Saxony rises high into the uplands, there are enormous contrasts between sophisticated Dresden, an old royal residence and center of art, grimy Chemnitz and other hives of industrial activity, and the rural Ore Mountains with many backward highlands where Slavic speech is common and culture is still on a primitive level.

Thuringia-Hessia is a complicated area comprising several political subdivisions in a broad upland region west of Saxony. It contains many basins, valleys, and individual highlands. The main eminences are the broad Thuringian Plateau to the south and the Harz Mountains to the north.

Coal and mineral resources resemble those of Saxony. Old silver mines in the northern part of the plateau established a tradition that turned readily to iron mining in the south or to winning a considerable variety of metals from the rocks of the Harz Mountains. Resources, though varied, were not large—a premium on raw materials favored concentration on expensive specialties, such as firearms and hardware.

Local sand deposits started a glass industry with such specialties as optical goods and glass eyes. Toy making, especially dolls, became a widespread domestic industry. Porcelain and terracotta wares were produced from local clay deposits, Meerschaum pipes found ready sale in all

parts of the world. Lignite from near Halle and salts from Stassfurt established a chemical industry that developed many high-value specialties, such as drugs, dyes, and explosives, and many bulk products, such as fertilizers. Any country that has to import such bulky raw materials as cotton needs space-filling return cargo to prevent ships from running in ballast. Little space or weight is required by enough cameras, glass eyes, or precision instruments to pay for a boatload of cotton. If a bulky commodity can be returned, the expensive products are carried practically cost-free.

Few parts of the world vie with Thuringia-Hessia in the matter of density of famous small towns and cities. Erfurt, favored by rich local agricultural resources, has become a city of 180,000. Jena, Gotha, Weimar, Eisenach, Göttingen, Hildesheim, and a host of other small places have attained world renown for at least one product, or activity.

Thuringia is crossed by a network of important routes between the Rhine Valley, Cologne, and other places to the south, and the great cities of the foothill zone and places in the north German plain. Kassel is especially noteworthy as a route center. From it, roads lead to Halle, Berlin (east); Hannover and Hamburg (north); Frankfurt-am-

Main (south); Coblenz and France (southwest); and the Ruhr, Cologne, Aachen, and other destinations (west).

Rhine Highlands is an artificial designation useful for including many individual uplands that extend from southern Thuringia-Hessia westward to the Ardennes and southwestward to Lorraine. The main topographic subdivisions are the Westerwald (north) and Taunus (south) on the eastern side of the Rhine, between which is the deep valley of the Lahn; and the Eifel (north) and Hunsrück (south) on the western side of the Rhine, between which is the deep valley of the Mosel (Moselle). South of Hunsrück are the Saar Basin and uplands of Pfalz, which culminate in the Hardt Mountains, a northward continuation of the Vosges. This short list by no means exhausts the number of names in common use for hills, plateaus, and other topographic features, and only in a general way does it coincide with local usage. The whole region is too complicated for more detailed subdivision in a general survey of regional geography.

Upland moors and forest lie above rather narrow valleys in this somewhat sparsely populated part of Germany. Only the Lahn and Mosel valleys are wide and continuous enough to support fairly dense agricultural populations or to serve as important routes. Coblenz (at the site of Roman *Confluentes*), where the Rhine Gorge crosses



Rhine Gorge landscape (U.S. Department of Agriculture)

the line of the Lahn-Mosel depression, dates from the first century as a significant center and now has a population of 60,000 in spite of limited hinterland. The main mineral wealth of the Rhine Highlands is building stone from the Eifel and some iron ore from the Westerwald.

The *Rhine Gorge*, from Bingen to Bonn, is a deep cleft through the Rhine Highlands. Ancient castles and a few large buildings of modern origin dot many of the summits on either side of the river. In the fourteenth century it was discovered that some varieties of grapes would grow this far north but only under very favorable conditions on south-slope exposures. The excellence of the dry wines produced in Rhine Gorge vineyards led to utilization of practically every square foot of available land by the vine. Where slopes offered insufficient foothold, masonry terraces were created, so that much of the right-bank landscape is artificial today. During the Middle Ages various toll houses were established for the purpose of extracting duties on goods carried along the river, several of which remain to impart a medieval touch to landscapes. Rapids near Bingen were an early obstacle to navigation, but these have been removed and the Rhine has become Europe's busiest river. Steamers and barges of all descriptions and from several nations run busily up and down its somewhat turbulent waters. Highways and railroads flank both sides of the river, narrowness of the gorge forcing them through many tunnels. Each little bench of flat land is utilized by farms or villages, several of which have become well-known resorts.

Westphalia, like Saxony, contains both uplands and lowlands. Within it lies the Ruhr coal field, which normally accounts for about three quarters of the German output. This coal is a continuation of the deposits that outcrop in Lancashire, West Riding, and the industrialized parts of the Low Countries. These layers also outcrop near Aachen in the vicinity of Dutch Limburg. In the Ruhr district and rather generally in western Germany and the Saar, the coal-bearing rocks are folded only gently, appearing at or near the surface in many places.

Coal that appears on the surface along the Ruhr Valley dips gently northward under the Westphalian plain so that at Münster it lies at a depth of about 5,000 feet. For many centuries to come, industrial centers will be localized at places where coal lies at rather shallow depths, but it is comforting to know that the reserves beyond today's economic limits of mining are tremendous, both at depth and in remote territory.

The Westphalian industrial district consists mainly of two lines of towns and cities, one ap-

proximating the course of the Ruhr and the other the Wupper, to its south.

Duisburg, the Rhine port at the mouth of Ruhr Valley, is normally one of the busiest commercial cities in Europe, in some years having handled more merchandise than either Antwerp or Rotterdam. Behind it lie Mülheim, Essen, Gelsenkirchen, Bochum, and Dortmund, the greatest industrial conurbation in prewar Europe, specializing in smelting iron and heavy industry. Ore was supplied from Lorraine and Sweden. While some ocean-going ships could land at Duisburg and considerable shipbuilding was centered there, most of the traffic was by barge. Canals from the Rhine and Ems lead to the cities in the industrial region, connecting them with the well-developed canal and waterways system of the central depression of the north German plain and other parts of Europe. Though destruction was particularly heavy in Westphalia during World War II, it is unlikely that the world can afford to leave this great industrial region inactive for many years. The population has clung tenaciously to its ruins and will be available to rebuild and re-establish productivity.

Düsseldorf, though not at the mouth of the Wupper, serves as Rhine port for that valley and as the leading financial and commercial center for Westphalia. Elberfeld and Barmen, recently combined into a great city called Wuppertal, strung along a valley so narrow that many factories had to be elongate, in order to conform to the topography. Winding directly above the channel of the little stream along the valley was a curious, space-saving means of transportation, an overhead monorail, from which were suspended many cars of conventional design that transported workers and others between home and factory. The emphasis of Wuppertal lies in textile manufacturing, a heritage of times when the main resources of the region were wool, from the poor pastures of surrounding uplands, and water power. Cotton and rayon now supplement woolsens.

Slightly south of Wuppertal are Solingen, the "Sheffield of Germany," and Remscheid, both specializing in cutlery and other high-priced steelwares. These places have vastly outgrown the local (Westerwald) iron deposits that started them off as sword-making centers during the Middle Ages.

West of the Rhine are the textile centers of Aachen (woolens), Krefeld (silks), and München-Gladbach (cotton)—all on the Westphalian plain but in Rhineland Province.

Cologne (Köln, Roman Colonia) became an

important trade center in ancient times because the Rhine Gorge was so difficult to navigate. Open plains led toward Flanders and the Rhine Delta. Wool from nearby uplands started a textile industry during the Middle Ages, and nearby coal resources brought a great diversity of industrialization in modern times. Textiles, machinery, chocolate, perfumery, and various other expensive luxury items are among its chief products. Its focal position brought it to the rank of Germany's sixth city.

The upland region that has been described thus far is often regarded as central Germany. Culturally much of it is transitional between the extremes of Prussia and Bavaria, between Protestantism and Roman Catholicism, and between a predominantly Nordic and a predominantly Alpine population. As a linguistic belt, it lies between the regions of old Low German and High German. Southern Germany extends into the Alps, but most of its area is within the uplands south of Thuringia. In the extreme west is one of Europe's most important lowlands and corridors, the Rhine Valley.

The *Rhine Valley* is a broad and straight lowland, flanked on the west by the Vosges and Hardt and on the east by the Black Forest (Schwarzwald) and Odenwald. Geologically it is called the Rhine graben, because it is a segment of the earth that has been lowered between faults or breaks on either side. When the floor of the Rhine Valley settled to its present position, a plateau was left standing on either side. The valley floor is about 160 miles long and between 15 and 25 miles wide. The floor is quite flat but slopes northward gently. Its typical elevation is 500 feet; while some of the flanking summits rise to about 5,000. Upland drainage is away from the Rhine graben westward toward the Moselle and eastward to the Danube. The Rhine itself rises in the Swiss Alps and flows along the entire length of the graben before reaching its gorge through the Rhine Highlands.

Soils are excellent and climate favorable to diversification of agriculture in the Rhine Valley. Winters are so mild that snow is somewhat of a novelty, a "white Christmas" being something eagerly hoped for rather than a certainty. The warmest summer month has a temperature of about 70° F., which permits ripening of various fruits, including cherries, and chestnuts. Wheat, barley, tobacco, hops, and other crops diversify agricultural landscapes. Vineyards cover the foothills on either margin, and magnificent forests cover the upper slopes.

In ancient times the Rhine had been a meeting

place of Latin and Teuton. The river itself was a rather formidable barrier, and swampy ground encouraged armies and colonists to remain on their own sides. Mediterraneans who arrived through the Gate of Belfort established colonies along the dry terraces and foothills to the west. Two main lines of villages and towns grew up, one toward either margin of the Valley, a pattern that has survived.

During the time of Germanic invasions, many tribes crossed from the east. The Alemanni settled in and along the Vosges to become the basic Nordic population of Alsace. Lorraine was settled by Franks who centered in Cologne and Aachen. Both of these regions are considered as part of Deutschland and Central Europe by Germans. Their main tradition is largely Latin and although a great many people are bilingual, French has been the dominant tongue since about A.D. 1000.

As part of Lotharingia, the Rhine Valley retains much "route-state" and "dividing-kingdom" heritage. It was crossed by Germany politically as a result of the Franco-Prussian War. Metz became a German military stronghold in a region of French-speaking people. The Treaty of Versailles gave Alsace, Lorraine, and a limited strip of the Rhine Valley to France, but a plebiscite in 1935 decided that the Saar be returned to Germany. A route state may be prosperous but unfortunate.

The Rhine Valley is focal to many routes. To the south, via Basel, are the main roads to Switzerland and Italy. The Gate of Belfort (Burgundian Gate), between the Vosges and Swiss Jura, leads southwestward to the Rhone Corridor and the Mediterranean. About midway on the west is the Saverne Gate, between Vosges and Hardt, leading to Paris and England. The Rhine Gorge leads northwestward, via Mainz, to the Low Countries and North Sea. Easy passes from Frankfurt-am-Main through Thuringia lead to northern Germany. Other passes lead eastward, to the Danube, Vienna, and Constantinople (Istanbul). The Main offers an easy route from Frankfurt to Nürnberg and is followed by a canal that connects the Rhine and Danube. The Neckar Valley passes around the northern side of the Black Forest to Stuttgart and Bavaria.

Frankfurt-am-Main is the focal point at the northern end of the Rhine Valley and is one of the main nodes in the German railroad system. Until recently it was Germany's leading financial center. An industrial age made Frankfurt an important producer of machinery, chemicals and beer. Nearby Offenbach specializes in leather goods and Hanau in jewelry. Wiesbaden is not only noted as a resort, but it is important industrially, many automobiles being manufactured in

its vicinity. Mainz, across the Rhine, lost much of its commercial significance when the river was improved for navigation by removal of rapids near Bingen, but it has considerable industry, especially leather goods and machinery.

Mannheim and Ludwigshafen, at the junction of the Neckar, are more industrialized and busier river ports than the cities toward the northern end of the valley. Coal from the Ruhr, petroleum from overseas, and iron from Lorraine and other places reach these ports, where they become the basis for keeping factories busy in supplying specialties to all parts of the world. These and satellite towns were heavily bombed during the war but their former importance is likely to be regained in rather short time. Nearby Heidelberg was spared by war. Located where the Neckar leaves the uplands, it is noted for its university and as an agricultural center.

The Black Forest resembles the lower parts of Switzerland. Many clearings are cropped, but agricultural pursuits are not particularly profitable, and incomes are supplemented by a wide variety of home industries, such as making clocks, jewelry, wood carvings, and textiles.

The Jura is a broad plateau region with many minor complications resulting from stream dissection and faulting. Its western part is the Swabian Jura. To the northeast is the Franconian Jura. Stuttgart is the great city of the former and Nürnberg of the latter. The rocks are the same age as the oolite of England, having been formed during a period that geologists call the Jurassic, because they were first studied in detail and described along parts of this plateau region. Highland pastures and moors rise above agricultural valleys where many small towns and cities make high-priced specialties, as in Thuringia. Würzburg, a crossroads on routes between Thuringia-Hessia and the Swabian Jura, is more industrialized than other centers. Stuttgart, the natural capital of Swabia and headquarters of the federated states of Bavaria, Baden-Württemberg, and Greater Hesse, became one of the leading centers in the American Occupation Zone, following World War II. It is important in book manufacturing and also in producing many specialties, such as electrical equipment. Heilbronn was favored by being head of natural navigation on the Neckar, but river improvement has boomed Cannstatt, a suburb of Stuttgart, as an industrial center in recent years. Nürnberg rose originally as a result of being granted special privileges, largely for the reason that it had few natural resources. Its monopolies developed people so skillful in manufacturing that the city has long since overcome all handicaps and produces large quantities of metal, glass, and

wooden wares, machinery, and electrical equipment.

The Alpine Foreland extends north from the Eastern Alps to the Danube. It is a northward-sloping plateau of limited agricultural usefulness. Contrasting with other upland parts of Germany, its surface bears many indications of the Ice Age. The north German plain was invaded from the north. The Alpine Foreland received its ice from the south, from the icecap that formed on the Alps.

The effects of glaciation are depositional across the Alpine Foreland. Very coarse morainal deposits, consisting of huge boulders, gravels, and sterile sands are strewn over wide areas. Soils are so poor that rye, oats, and barley are the main cereal crops. Much land is given over to pasture. Dairying is a major activity. Hops and other crops are raised here and there, mainly along streams where soils are favorable. Winters are severe and summers hot. Lakes and meadows lie between moraines, especially toward the mountains.

The Alpine Foreland was not attractive to the Romans. They followed streams in crossing it and established forts and settlements at nodal points. The most important of these were along the Lech, a stream leading from several Tirolean passes to a junction with the Danube, from whence their roads led toward the Rhine Valley and various places in the uplands.

Augsburg long remained the leading trade, religious, and political center of the Foreland. Rather easy access to Brenner Pass made it an important distributing center for Venice. Nearby Ulm, at the natural head of navigation on the Danube, and Ratisbon (Regensburg), at the north bend of the great river, were other points that attracted early attention. Ratisbon became capital of Bavaria in the sixth century and served as the base of the march (Ost Mark) that led Germans downstream to Vienna and Austria (Ost Reich, east territory).

Munich (München), on the Isar in the center of the Foreland, was a rather late development. By the seventeenth century it had become a beautiful medieval town, but its rise as the leading city of southern Germany did not gain momentum until the nineteenth century. Isar water power, hard water perfectly suited to brewing, and central position in a railroad network were factors that expanded the city far beyond its original walls.

Hydroelectric developments along Alpine slopes have favored Munich, Augsburg, and other Bavarian cities industrially during recent years. In few areas have landscapes so many elements ranging from medieval to ultra-modern.

SOUTHERN MOUNTAINS

The Alpine region of central Europe extends eastward for about 320 miles from the Rhine to Vienna. Four fifths of this territory was included in the Austria of 1937. The western end extends across Liechtenstein into Switzerland, and a narrow northern strip lies in Bavaria.

High latitude gives the Alps a far more rugged aspect for any given elevation than exists in mountains in the United States. Timber lines are lower. Ice Age glaciation was more severe. Landscapes that occur at elevations of 12,000 feet in the central Rockies have equivalents in the Alps below 5,000 feet. Cold winters and heavy snows nourish many important glaciers of sizes that greatly exceed any now existing in the United States.

Slopes below the timber line are heavily covered with forest. Mineral deposits are neither abundant nor rich, but limited amounts of iron, lead, zinc, and bauxite (aluminum ore) have been mined.

Alpine valleys are typically deep and narrow, a characteristic that disappears eastward. In Tirol less than 5 per cent of the land is cultivated, but toward Vienna many large districts are more than

15 per cent under plow or in fruit. Valleys of the Inn, Salzach, Enns, and several other streams have long served as important routes and have attracted considerable population.

Brenner Pass is an easy and extremely ancient route between Italy and central Europe. Semmering Pass leads to Vienna from Italy. Many passes across such ranges as the Oetzthaler Alps, Dolomites, Hohe Tauern, Carnic Alps, and Hochschwab serve only local purposes. Some 500 miles of electrified railroads wind through the Eastern Alps.

Isolated in their valleys, most inhabitants of the Eastern Alps exhibit highly localized culture traits, such as individuality in dress, decoration of habitations, and dialects. Household crafts supplement the meager incomes obtainable from agriculture, dairying, and lumbering. An enormous amount of effort is expended in cutting and curing hay for winter feeding of livestock, as in Norway. Hay, cut by hand on "alps," or small upland flats, is dried and stored in upland cabins to be sledged down to barns after the arrival of winter snows. Tourists have come in ever increasing numbers to view this picturesque country. Innsbruck, Garmish-Partenkirchen, Ober Ammergau, and other centers attract visitors not only in summer, but compete with Switzerland as centers for winter sports.

13: Cultural Succession in Germany

Celtic peoples occupied much of Germany in prehistoric times. They lived in scattered habitations, as a *dispersed* population, rather than in *nucleated* villages, or towns. There is a certain independence in the mentality of the Celt that finds expression in his willingness to live alone in a hut or house removed some distance from the nearest neighbor. The dispersed rural life in the United States, which seems strange to most European World peoples who prefer to live in villages even though it occasions long trips to till fields, is possibly a continuation of this old Celtic tradition.

Place names of Celtic origin are widespread throughout all territory west of Bohemia, particularly for natural features. Rhine (Rhenos) and Danube (Danuvius) are notable examples.

Germanic-speaking peoples arrived among the

Celts as early as 2000 B.C. Their earliest stronghold was along the Baltic coast west of the Oder, but they spread along the North Sea as far as the Rhine Delta at an early date. Angles lived in Jutland, Saxons along the lower Elbe, and Frisians along the Dutch coast. Jutes occupied the zone just inland from the Frisians. Goths, Vandals, Burgundians, Franks, and other Nordics with Germanic tongues occupied the forests in much of which later became northern Germany. Some of the Goths and others crossed the Baltic to Skane and other parts of Sweden.

These Germanic peoples dwelt in distinct villages, in nucleated settlements that could be defended. Many of these early villages were given names ending in *-ingen*. Places with these names are numerous in the whole area between the Rhine and Vistula, and between the Baltic and Danube.



Nucleated village (Odenwald) (American Geographical Society)

nees into Iberia, and the Vandals continued into northern Africa.

General dissolution of Roman political organization occurred during these invasions of Germanic peoples into western and southwestern Europe. The official boundary of the Empire, set by Vespasian during the first century and which had not been modified in the slightest detail by the year 253, collapsed completely. The Germanic frontier was not this official boundary in reality. It was mobile and indefinite. Germanic tribes had a firm grip on much of France, and on parts of Italy and Iberia, even before Rome collapsed.

The Germanic peoples came into Roman territory with practically no concept of nation in the modern sense of the word. Political organization was thought of in terms of peoples and individuals, rather than in connection with territorial claims. Germanic government had long been something of a tribal affair, suited to mobility. In feudal times it was adapted to nucleated villages clustered about castles where rulers maintained strongholds.

It has been estimated that the major Germanic groups, such as Goths, Saxons, or Franks, consisted of possibly fewer than 150,000 individuals when the great migrations were in progress, and that minor groups, such as Burgundians and Lombards may not have numbered more than 25,000. All of the Germanic tribes combined would not have equalled in population many single cities today.

The main political result of the Germanic migrations was the establishment of tiny political units. These gradually evolved into the intricate feudal system that characterized medieval Europe. Vestiges of this system are still strong in many parts of Europe, mainly in Teutonic lands.

HOLY ROMAN EMPIRE

The greatness of Rome has profoundly affected subsequent European culture. The ideal of Empire has never been lost. The advantages of organization, peace, and justice have long been remembered. Even Germanic peoples came to recognize such advantages. Their first major political attempt to imitate Rome was bumbling and ineffective, but it was held on to with stubborn tenacity for many centuries.

Charlemagne, a Frank, rose so high in the feudal system that he felt it necessary to be crowned Emperor. This great event had to occur in Rome. The year was 800. The political events to follow were about as complex as the world has ever witnessed.

The central theme of Teutonic organization

took the form Holy Roman Empire; commonly characterized as neither Holy, Roman, nor Empire. It was a loosely bound, ever-changing confederation of generally powerless states, most of which were minuscule in area and in population. The alliance waxed strongest under Henry III in 1039-1056, and it did not die completely until the time of Napoleon in 1806.

Aachen, the Frankish capital, was the early center of centralized Teutonic government, but the capital shifted from one place to another during Holy Roman Empire history. Most of the Emperors were crowned at Frankfurt-am-Main, but the Po Valley and Bavarian rulers at times dominated Empire affairs.

Germans between the Harz Mountains and the North Sea remained quite aloof and all Scandinavian Nordics kept wholly outside of the Empire. Swabians, in territory where considerable Roman heritage remained, entered into Empire activities with vigor. They traded freely with people to the south of the Alps and with Burgundians and others beyond the Gate of Belfort. These contacts resulted in considerable Latinization culturally.

The spread of Christianity among Germanic-speaking peoples became quite general under Empire auspices, but concepts of strong nationalism made little headway.



Holy Roman Empire

DRANG NACH OSTEN

Soon after Germanic peoples started migrations southward and westward, they began to feel pressure at their backs. Indeed several important forays by strange peoples from and beyond eastern Europe had occurred even earlier. In the main these invaders had left or had been assimilated without greatly upsetting Teutonic ways. Their invasions had centered generally in the southeast in the Balkans or on the plains of Hungary. But in the sixth century, increasing numbers of Alpines and Mongoloids were appearing along the eastern borders of Germanic territory speaking strange, Slavic tongues. New waves surrounded and displaced Teutonic villages. Slavs pushed the German frontier westward from the Vistula to the Elbe and Saale. Thrusts along the Baltic brought them as far as Lübeck. The flood of the Slavic tide lasted for about three centuries, the ebb setting in, in about 800.

The *Drang nach Osten* (drive eastward), or reverse movement in which the Teuton-Slav frontier was again shifted eastward, lasted for about four centuries. It took the form of a series of marches, which eventually re-established the Vistula frontier of A.D. 600, and to the north it passed well beyond, along the east Baltic coast. The first



Drang nach Osten

Teutonic drive resulted in the occupation of Altmark (Old March) in the vicinity of Magdeburg on the Elbe. Later to follow were Mittelmarch and Neumark, progressively farther to the east. By 1141 the seat of government had moved across the Elbe into Brandenburg. Christianity moved with the Teutons.

The marches were not continuous, nor was warfare general during the eastward displacement of the frontier. The idea of pioneering, or developing new territory, was strong during the whole movement.

When Slavs were living west of the Vistula they had established villages of their own characteristic pattern, which tended to be circular around a central field for livestock. Many village names ended in *-zig* or *-in*. Teutonic pioneers gave places names ending in *-schwand* and *-bran* (burning), *-metz* and *-hau* (hewing), *-hagen* (fence), *-schlag* (fill), *-au* (meadow), *-ried* (marsh), *-roth* or *-rode* (rooting up), and others associated with ideas of pioneering. Many of the more important nucleated villages bore names ending in *-dorf*, which is in common usage all the way from England to the Vistula.

Many Slavs were absorbed and Germanized during the *Drang nach Osten*. Nordic characteristics were diluted. Numerous people began to appear with extremely feeble pigmentation in skin, hair, and eyes, with rather broad heads quite flat in back, with rather prominent cheekbones, and with nostrils directed somewhat upward. These are East Baltic racial characteristics. Other arrivals were swarthy, extremely roundheaded, and short-statured Alpines. A few Slavic communities retained their identities and tongues, as has been the case of the Wends in the Spreewald just east of Berlin, but Germanization was the general rule. Quite common was a racial distinction between Nordic or East Baltic overlord and Alpine peasant in territory to the east of Brandenburg.

By the twelfth century the Slavic frontier lay beyond Mecklenburg. During the next century Prussia was captured and Silesia occupied peacefully. Other Germans were spreading southward across uplands into the relatively unoccupied forests of Bohemia. Many Saxons moved into the part of Germany now known as Saxony.

COMMERCIAL RISE

Certain Germanic groups had long been traders. They had found amber along the shores of the southeastern Baltic and had learned that a market existed for this fossil resin in Mediterranean lands. Between 1800 and 1000 B.C. this commodity was carried up the Elbe, along the valleys of the

Moldau (Bohemia), and other streams leading to the Inn (Austria) and Brenner Pass. It reached northern Italy from the valley of the Adige. Furs and leather also moved along this ancient "amber route."

Later amber routes led along the Oder and March (east of Bohemia), along the Danube, and to Byzantium (Istanbul). This trade became particularly active and turned the thoughts of many Germans toward commerce.

Germanic migrations broadened the base of German trade. The variety of products exchanged between central Europe and the Mediterranean increased. During feudal days it became necessary to build large warehouses, often requiring protection of walls and moats. Villages and trade centers were likely to be walled, especially in the southern parts of Germany. Three towns retain these medieval walls, Nördlingen, Dinkelsbühl, and Rothenburg, but most have outgrown their confines. Gates and remnants of walls are rather numerous, as in Munich. In many cities the positions of old walls are indicated by more or less circular boulevards, as in Vienna. Irregular, narrow streets are characteristic of parts of towns that lay within the original walls, whereas rectangular or other fairly regular patterns occur beyond.

Germans along the Baltic developed a trade of their own. Its evolution was wholly independent of any Holy Roman Empire activities. Individual seaports were established, mainly during the twelfth and thirteenth centuries. Scandinavian

raids were troublesome and ships sailed with fair prospects of being overhauled by pirates. Largely for purposes of self-protection, several of the Baltic ports founded an association in 1256. An early objective was the clearing of the Baltic of pirates, but ideas soon shifted toward commercial development and trade monopolization. Thus began the Hanseatic League.

Membership in the League was confined to seaports at first, but the base was broadened to include river ports. In all, about 100 cities and towns became members at some time or other. Lübeck stood foremost and served as headquarters. Its flourishing commerce required the dredging of a canal between the Baltic and the Elbe during the thirteenth century. Cologne, with commercial traditions dating back to Roman times and a lively trade with England, ranked second in importance, and Hamburg, near the mouth of the Elbe, ranked third. Stettin, Danzig, and Königsberg became important league members to the east. With increased prosperity, Hanse depots were established in foreign lands, all the way from London to Trondheim and eastward to Novgorod-the-Great, not far from Leningrad.

Hanse ports still have a distinctive atmosphere. Most of them retain tall warehouses, with vertical lines of doors marking their half dozen or so floors into which goods were hoisted and pushed. They have generally kept their old traditions of



Lübeck, Sixteenth Century salt warehouses

commerce. Though the League declined after the fifteenth century and lost practically all traces of significance during the Commercial Revolution, the main interests of Hanse ports have remained commercial. Few have developed much in the way of political significance, almost none became a national capital, for even a short period of time, but today many of them are the leading trade centers and seaports of northwestern Europe.

More political in intent was another Germanic movement along the Baltic, quite independent of the Holy Roman Empire—the activities of the Order of Teutonic Knights. This movement centered in Marienburg, on the Nogat, a small Vistula tributary along the east flank of the delta. The stronghold was essentially a *march site* fortification to protect Teutons from Slavs, and it served later as a base of advance eastward.

The rise of Prussian influence in German affairs was stimulated greatly by the success of the Teutonic Order. Königsberg (Kaliningrad) was established in 1255 as a march-site stronghold well to the east of the Vistula. It served as a center for the Germanization of East Baltic and other peoples over a wide area that later became East Prussia. From it went Teutonic Knights northward along the east coast of the Baltic to establish other outposts.

Danzig, on one of the western distributaries of the Vistula, was rather late to rise—a matter that is related to shifting channels. It dates from the fifteenth century. As a Hansard depot in Germanized territory at the mouth of a large river system, it grew rapidly and became one of the leading ports of the Baltic.

TEUTONIC DECLINE

The *Drang nach Osten*, the rise of Hanse trade, the establishment of political control to the north-east by the Order of Teutonic Knights, and trade and cultural achievements in Holy Roman Empire lands had placed in the hands of the Germans a position of leadership that might well have gained momentum enough to have established Germany as supreme among European nations throughout modern times. Such was not the course of history. The blossoms of Middle Ages Teutonism were premature. Blight set in from several directions. The earliest fruits of modern progress were harvested in other lands.

Teutonism made little progress in old Roman territories. When Germanic-speaking Nordics crossed the Lotharingian Corridor they generally became Latinized.

Romans had advanced into the Rhine Valley mainly by way of the Rhone and Gate of Belfort. *Raurica*, their first colony on Germanic borderlands, occupied the present site of Basel in the southern end of the Rhine Valley. A northward march established *Argentoratum* (Strassburg), *Mogontiacum* (Mainz), *Confluentes* (Coblenz), *Colonia* (Cologne), *Novesium* (Aachen), and other centers along what later became the Lotharingian Corridor. The earliest of these establishments dated from about the beginning of the Christian Era. They all served as nuclei for maintaining and spreading Mediterranean culture.

During the centuries when Germans were pushing Slavs eastward, the Nordics who had settled west of the Lotharingian Corridor were discarding Germanic tongues and becoming Latinized. Franks in the Ardennes, Vosges, and territory beyond were giving up their Teutonic culture so thoroughly that their name was to be given to the nation that has done the most to advance the culture of Mediterraneans into northwestern Europe. Burgundians west of Belfort eventually lost practically all traces of Teutonism. Only family and place names remain to recall their Nordic origins. Closer to the Corridor, in Lorraine, Alsace, and Switzerland, transitional cultures developed, blending traits of the North with those of the Mediterranean. Late medieval and modern times have witnessed a general decline in Teutonism in practically all territory west of the Rhine. Contrary to the often-expressed hopes and boasts of the Germans, the Rhine has tended to become Germany's boundary, rather than Germany's river. A wide zone of bilingualism to the west of the Rhine is viewed as thoroughly Germanic territory by the Germans. The claim has little more weight than the French might have in claiming all of Switzerland culturally. This part of the old Lotharingian Corridor is not happy in affiliation with nations on either side.

The Reformation caused sharp cleavages within the Holy Roman Empire. States that had been more or less united by the traditional bond were now separated and in many cases became irreconcilable enemies. The Thirty Years' War, which died down into a "peace of exhaustion" with the Treaty of Westphalia in 1648, was chiefly a conflict between small Germanic states. Many wide districts lost as much as 90 per cent of their population between 1631 and 1648. Magdeburg and other strongholds were destroyed. Impoverishment was general. Germany had become a "land of philosophers and poets."

There had been no true German nation to take part in the early phases of the Commercial Revolution. No German had made a name in the

chronicles of exploration. A destitute and impoverished land had little to contribute to the early phases of the Industrial Revolution. Commerce was unimportant in a land without colonies or sea power. Sweden had come into possession of the important harbors along Germany's Baltic and North Sea coasts.

RISE OF GERMANY

The modern unification of Germany started from a base of 368 separate political units, 37 of which might be recognized as "states" of some consequence. Here was the political heritage of the Holy Roman Empire, Thirty Years' War, and political ineptitude—the last great relic of feudalism in northwestern and central Europe.

Prussia took leadership in unification movements, but results were unimpressive until the time of Napoleon. More than 200 minor states disappeared and feudalism suffered severe blows. A customs union was established in 1819 and not many years elapsed before some sixty tariff walls that stood firmly in the way of commerce disappeared. The southern states of Bavaria and Württemberg formed a similar partnership in 1828. Six years later they merged forces with the Prussian Union.

Prussians developed considerable military skill. German coasts were regained from Sweden, Silesia was conquered, and part of Poland added to their domain. By 1864 they were ready to declare war on Denmark—a highly successful venture that resulted in the acquisition of Schleswig and Holstein. By 1867 most German states had joined the Prussian-dominated North German Confederation.

Austria stood aloof from the North German unification movement. Hohenzollern influence in Prussia clashed with Hapsburg ambition in Austria. Among common people was a general feeling of superiority of Prussians over Austrians and of fear and contempt by Austrians toward Prussians. The religious cleavage was also sharp, but that had not interfered with unions such as between Protestant Prussia and Roman Catholic Bavaria.

Germany as a modern nation dates only from the Franco-Prussian War, which started in 1870 and ended the following year. State after state joined Prussia in the war with France. The outcome indicated that the march tradition could be turned westward with success. Alsace and part of Lorraine were added to the new nation. The King of Prussia was chosen to head the political union, and according to best Holy Roman Empire tradition, was given the title of Emperor (Kaiser, Caesar). Austria was denied admittance to the empire.

INDUSTRIAL AND AGRICULTURAL REVOLUTIONS

The Industrial Revolution reached Germany after 1870. English, French, Flemish, American and other sources had furnished the impetus and inventive genius that solved the fundamental problems of industrialization long before Germany entered the scene in other than primitive ways. Cities had started to grow in many western European lands, but Germany had only towns. Colonial empires had been established, lost, and traded, but Germany owned not an acre beyond the limits of Europe.

Late start provided the possibilities of rapid rise. Slow evolution from water wheel through wood as fuel to the steam engine was unnecessary. Germany started its Industrial Revolution with almost modern steam engines. It found itself not only endowed with some of the finest coal deposits in Europe but also a variety of metals that appeared sufficient for all needs. Its soils were fertile over large areas, so the problem of feeding a growing industrial population was not hard to solve. Central position was one that stimulated trade.

By 1914, Germany was surpassed only by Great Britain and the United States in the value of its foreign trade. Colonial possessions had been acquired—not the best, nor even satisfactory—but Germany could hold its head upright from the colonial standpoint. It had acquired many islands in the Pacific and such parts of Africa as were found available. These were mainly places with either excessive or deficient precipitation, but the Germans started developing them with diligence.

World War I, 1914–1918, started with Germany at its zenith in industrial and commercial activity. The tradition of the march and success in adopting the ways of great western European nations led to increasing ambitions, which had as a minimum goal the incorporation of all Deutschland into the Deutsches Reich.

The sting of defeat, territorial losses that included all colonies and much of the Lotharingian Corridor as well as less-Germanized lands in the east, industrial and commercial losses that reduced activities to less than half their prewar status led to resentment and a new determination to assume world leadership, which culminated in the outbreak of World War II, 1939–1945. After 2,075 days of the most destructive warfare in the history of the world, German collapse was complete. Of somewhat over 22 million soldiers and civilians who lost their lives in the struggle, about 7 million

were Germans. German industry again received a crippling blow and German commerce came to a standstill.

A good deal of German agriculture had been backward prior to 1870, but the same scientific zeal that was applied to industrial development led to wheat yields higher than those on the more fertile soils of France, first world rank in production of sugar beets and potatoes, and second rank in rye. Intensive livestock raising required that one third of all cultivated land be given to hay. Some 90 per cent of all land was brought into agricultural use and Germany became about 90 per cent capable of producing its own food—an extremely high amount for a western European nation. About one third of the population remained rural.

Beets, potatoes, and rye covered poorer soils, while wheat and tobacco took the best. A surplus of sugar and potatoes in part met the bill for food imports, the potatoes being grown largely for commercial purposes, as a source of alcohol. The main food imports included some cereals, eggs, dairy products, fish, tropical products such as coffee, cocoa, and bananas, and semitropical citrus fruits.

German industry grew to a point where more than 800,000 persons were employed in mining coal, 90 per cent of which came from Ruhr and Silesian fields. Iron was present in proximity to both but in amounts insufficient to meet demands, so Germany became Sweden's best customer for the rich ores of Lapland, and France was called upon to furnish iron from Lorraine. Zinc, lead, copper, and other metals were at hand, but in quantities that had to be supplemented by huge imports. Extensive peat and lignite deposits became both sources of fuel and the basis of an important chemical industry. Germany rose to pre-eminence in the latter field. Rich deposits of potash and other salts stimulated chemical research to such a degree that a list of the world's greatest discoveries in chemistry contains few that are of non-German origin. New products appeared in quantity and found ready use and sale throughout the world.

At its industrial zenith, Germany became the leading European producer of iron and steel goods, first in the manufacturing of metalwares of all kinds, first in the production of chemical products, and second as a consumer of raw cotton. In all, 60 per cent of its imports were raw materials, 25 per cent were foods and beverages, and only 15 per cent were finished goods. Over 12 million people were engaged in manufacturing, about

one third of whom were in textile industries. France, a leader in the Industrial Revolution, had fewer than half as many industrial workers.

The needs of a newer age found Germany deficient in but one main source of power, petroleum. Supplies were imported from Poland, Rumania via the Danube, and from overseas to ports along the Rhine and North Sea coast. Fairly good hydroelectric resources existed and were about one-quarter utilized at the outbreak of World War II.

URBANIZATION

Urbanization was late in reaching Germany. The end of the Thirty Years' War found Germany's population so decimated in rural areas that relatively little city growth was possible. European population increased from 100 to 187 million between 1650 and 1800. In other nations a very large share of the increase occurred in cities, especially in Great Britain, France, and Russia. The greatest German gains were confined to Prussia and were mainly rural.

Berlin was a town of 6,000 in the seventeenth century. By 1800, when the population of London was nearly a million and Paris over half a million, Berlin was a city of 170,000. Moscow, St. Petersburg (Leningrad), Vienna, Amsterdam, and Naples were all larger than the Prussian capital. In 1850, Berlin, with under half a million, was half the size of Paris. Hamburg trailed behind Berlin with 130,000 in 1800.

Though early urbanization lagged behind that of other nations in Europe, it moved rapidly enough after getting under way. By 1940 at least 63 cities in Germany had populations exceeding 100,000, 6 more than in highly urbanized England. Table 7 gives more recent comparisons.

It will be noted that in Europe and the Soviet Union (with non-European cities included in Table 7 for the reason that each is functionally part of the European World and is physically attached to the "continent" of Europe) there are 147 cities of over 200,000, of which 56 exceed half a million and 17 exceed a million according to the best estimates available for 1946. Germany stands close to the Soviet Union and ahead of either England or the entire United Kingdom in number of cities of over 200,000.

The most fictional part of Table 7, or any similar comparison, is the size of the largest city. The values given refer to "greater" cities—entire conurbations—but these depend on varying types of local recognition. In the cases of London, Paris, and Berlin the area included is generous enough to really include the entire conurbation. This may

not be true in the case of Moscow. It is certainly not true of New York. Such parts of the conurbation as overlap into New Jersey and Connecticut are ordinarily excluded, for the artificial reason that state boundaries have been crossed.

Table 7 European urbanization (1954 estimates)

	Number of cities with populations exceeding:			Population of largest city (millions)
	200,000	500,000	1,000,000	
Soviet Union	36	11	2	4.14
Germany	24	8	2	3.20
United Kingdom	21	9	3	8.35
Italy	11	5	3	1.64
France	8	2	1	4.95
Spain	8	3	1	1.44
Belgium	7	3	1	1.31
Poland	5	2		.69
Netherlands	3	3		.85
Turkey	3	1	1	1.00
Austria	2	1	1	1.76
Czechoslovakia	2	1		.92
Greece	2	1		.56
Portugal	2	1		.79
Sweden	2	1		.97
Yugoslavia	2			.39

Nations with but one city of over 200,000; its population (millions)

Hungary	(1.73)	Norway	(0.44)
Denmark	(1.04)	Bulgaria	(0.43)
Rumania	(1.04)	Switzerland	(0.39)
Eire	(0.50)	Finland	(0.38)
		Trieste	(0.30)

Berlin may be the largest city on the European mainland, in spite of the fact that Paris is shown to have a larger population in Table 7. Moscow may be actually larger than either, some rather careful estimates of its population being in the neighborhood of 5 million. In any event, Greater London is approximately twice the size of Berlin. Berlin has vastly outdistanced Vienna, Amsterdam, and other European mainland cities that were its superior in 1800.

The rulers of Brandenburg in selecting the site of Berlin in the fifteenth century were influenced strongly by considerations of defense. Nearby rivers, lakes, and swamps provided natural obstacles to invasion. The immediate site had the advantage of an island in the Spree, to facilitate crossing. Little attention was given broader questions, such as proximity to agricultural land or other resources. From many standpoints it seemed unreasonable that the site should be one where a great city might develop.

Political privileges favored Berlin as it became, in turn, the seat of the kings of Prussia and capital of the Empire. Road and railroad networks were designed around Berlin as a hub; commerce and

trade were funneled through it. A canal between the Oder and Elbe led past it. Though natural resources were not available locally, they could be brought to the city, and a great amount of manufacturing eventually occurred. Furniture, clothing, and similar industries flourished as population increased. Printing trades expanded, as they ordinarily do in capitals. Processing of raw materials of all kinds was favored by the excellent communications system. Stettin, the outport, though far removed, provided materials of overseas origin. At its zenith, immediately before the outbreak of World War II, Berlin had risen to front rank industrially and was exporting a large number of specialties.

The destruction of Berlin during the war was so intense that many believe that the city will never regain its former position. This viewpoint, which seems reasonable enough during and immediately after great wars, has ordinarily been proved invalid not many years after hostilities cease. The long, monotonous rows of granite buildings that line Berlin's many streets, though severely damaged, will generally be restored, and the huge population, which was increased at an overwhelming rate by the arrival of German refugees from Poland and the Baltic States toward the end of the war, will likely remain to revive commercial and industrial activities. In 1952 the population was nearly 3.2 million.

Hamburg, 1.6 million, became second city of Germany. Like London its location depended largely on being the lowest bridgesite on a river, but unlike the British capital, its immediate hinterland was not particularly productive. The Elbe is navigable into Bohemia and leads to the North Sea. It was natural that the port at its mouth should become the great export center for much of central Europe. Half of the overseas trade of Czechoslovakia passed through Hamburg. Great quantities of foreign wheat, petroleum, and even British coal were among its imports. With increasing commerce and growing sizes of ships, Hamburg developed a huge and satisfactory artificial harbor and an outport, Cuxhaven, 60 miles downstream. Increasing population fostered many industries, particularly those favored by imported petroleum and the sugar surplus arising in the beet fields of its rather infertile surroundings.

Munich, 0.831 million, developed along lines similar to Berlin in many ways. Located in the heart of the rather barren Alpine Foreland at a site that no Roman would have thought advantageous, it became the object of political favoritism, as capital of Bavaria. Barley, hops, and hard

water developed it into the world's greatest brewing center, where "some sixty great breweries strive to produce the world's best beer." The transportation system of southern Germany used Munich as a hub, so that like Berlin, commerce was favored, population increased, and industry arose. In more recent years the industrialization benefited greatly by proximity to Alpine sources of electric power. Unlike Berlin, the core of the city was an extremely attractive relic of medieval patterns and architecture. One of the great cultural losses of World War II was the destruction of much of central Munich.

Cologne, 0.591 million, arose commercially at an early date. Romans had established the nucleus; difficulties with natural features and people along the Rhine Gorge provided stimulus. It was an important collecting and distributing center long before the Hanseatic League was founded and ranked second commercially during the zenith of the Hanse period. Forests and sheep in nearby highlands and coal not far away favored Cologne industrially. Woolens were produced at an early date and their high quality reflected an example being set not far away by skilled Flemish weavers. Excellent transportation facilities and proximity to the Ruhr developed it into leadership in many luxury products and in the manufacture of machinery. Nearby Bonn became capital of the western zone of Germany during the military occupation following World War II.

Political circumstances happen to deny the Ruhr a foremost place in a list of great German cities. Had a "City of Westphalia" been established on the expanded territorial scale of Greater London, Berlin, or Paris, its population would have been at least 2.25 million, if only the main concentration of iron and steel centers were included, or a million or so larger than that if the boundaries were extended across a few hills into the densely populated, textile-producing valleys to the south. The Rhine ports of Duisburg, 0.409 million, and Düsseldorf, 0.498 million, serve five cities with populations of more than 300,000, including Essen, with 605,000. Heavily damaged by war, this industrial region soon demonstrated its significance in European economy in the early days of peace. Europe had so long depended on Ruhr coal that strenuous efforts were made to increase production almost as soon as hostilities ceased, and serious attention was being given the possibility of placing the region under international control.

Leipzig, 0.608 million, and *Dresden*, 0.468, are the great cities of Saxony. The former had long

been an important route and market center. In an industrial age it had the advantages of nearby coal and metals. Forests on the upland slopes to the south stimulated paper manufacture, which led to foremost position in book publishing and a host of satellite industries. In recent years it turned to the making of electrical goods and a wide variety of other things. Dresden had the advantage of proximity to the Elbe Gate into Bohemia, but its early rise was largely the result of political favoritism. As a royal seat it developed culturally and artistically. Ceramic industry was favored by the presence of clay deposits. Dresden china became world famous.

The people of Saxony began to develop manufacturing skills at a much earlier date than peoples in other parts of Germany. The Ore Mountains not only provided a wide variety of metals, but also wood, pulp, leather, and wool. Stassfurt, not far to the northwest, provided the salts that led to the world's foremost chemical industry. Adjustments to the new order of an industrial age were made easily and factories sprang up in great density along the borders of the lowlands.

Chemnitz, 0.251 million, and *Zwickau* are typical products of industrialism in Saxony, resembling in general appearance drab industrial centers along the margins of the Pennines. Chemnitz is often called the "Manchester of Germany," because of specialization in cotton weaving. Life is closely regulated by hours of factory operation. Chemnitz, however, does not have the peculiar and individual advantages enjoyed by English Manchester for monopolization of cotton industries. Aachen, Wuppertal, Hamburg, and other places are severe competitors, favored by locations closer to the places where bales of cotton from overseas actually land on German soil. The main resources that favored Chemnitz were fuel and the presence of skilled workmen long used to manufacturing woolens. Chemical industries and other kinds of manufacturing arose and grew apace with textile industries. Many other centers along the fall line evolved along similar lines.

Silesia long remained on the frontier between Teuton and Slav. The rise of *Breslau*, 0.625 million, was as an agricultural and commercial center, depending on this borderland trade. Though Upper Silesian coal deposits are second only to those of the Ruhr and many metals are mined in their vicinity, industrial rise was slow to start in Upper Silesia. The Treaty of Versailles dealt the region a crippling blow by creating national boundaries in such a way as to parcel among three nations an area that seems destined to rise to third or fourth rank among Europe's industrial districts. No city between German Breslau and Polish Krakow indi-

vidually attained a population of as much as 200,000, nor did the combined populations of Czechoslovakian, Polish, and German industrial centers in Upper Silesia attain the population of the largest single city in the Ruhr.

Danzig, 0.163 million, and *Königsberg*, 0.216, prospered as ports, commercial centers, and by industrialization along such lines as agricultural manufacturing and shipbuilding. The fact that their hinterlands were largely non-Germanic, and hence nonindustrial, was an advantage because they provided many cheap raw materials and agricultural surpluses for export.

The rich Rhine Valley has long been dominated by *Frankfurt-am-Main*, 0.524 million, its great commercial center. Only within quite recent years did Berlin outdistance it as a seat of banking and exchange. Nearby is industrialized *Mannheim*, 0.244, which made its start toward becoming a great center of chemical production because salt was available from the basin of the Neckar and wood from nearby forests served as fuel. Across the Rhine were the old Roman towns that became modern cathedral cities, with industries profiting by proximity to iron and coal from the Saar and elsewhere.

Routes east from Frankfurt lead to such specialized manufacturing centers as Würzburg and *Nürnberg*, 0.360 million, and a host of places famous for at least one product, some of which were mentioned in the last chapter. *Stuttgart*, 0.482 million, in addition to its high and varied industrialization, lies on an important route between the Rhine Valley and Bavaria.

Strasbourg, Mulhouse, and several other old Lotharingian Corridor towns in the southern part of the Rhine Valley were taken by Germany in 1870, to be returned to France in 1919. Basel, in the extreme south, developed as a route center and textile (cotton) producer under Swiss nationality. It has the peculiar advantage of being on

the most direct route to Italy, via St. Gotthard, with easy access to Belfort and the Rhone Corridor, and comparatively easy routes eastward to the Danube.

POSTWAR ORGANIZATION

Great as are the scars of war, natural landscapes can change but little. Profound as have been human dislocations, the main culture groups in Germany occupy their old positions. It must be expected that cultural landscapes will develop rather generally along patterns characteristic of prewar times.

The division of Germany into four occupation zones introduced cultural complications that are not likely to be long lasting, except in one regard. Slavic control was extended westward to its former limits, and somewhat beyond in Thuringia, over an area with a population of 24 million. This broad eastern part of Germany, which extends roughly south from Lübeck to the most northern part of Bavaria and east to Poland, may be lost to the Northwestern European culture realm. It is not likely to become incorporated in the Eastern realm, unless Slavic control lasts for several centuries, an experience that seems unlikely. The probability is greater of incorporation into the Shatter Belt, the zone of confused peoples, linguistic chaos, and political instability that has long flanked northern Germany on the east. Territory annexed by Poland faces this fate most certainly.

Within the zone of Slavic occupation lies roughly one third of Germany's resources. The other two thirds constitute a basis for the formation of a federated German nation that will remain culturally Northwestern European under any political eventuality now in sight.

14: Physical and Cultural Background

The Eastern Realm of the European World has poorly defined physical boundaries. Its nucleus is the broad eastern part of the European plain between the Arctic Ocean and the Black and Caspian seas. Linguistically it is the land of the Slav, but it speaks many different tongues. It is territory of extreme racial contrasts and admixtures. In terms of political boundaries, Eastern Europe is about coincident with the old Russian Empire. Its dominant culture traits impress Northwestern Europeans as strange. To many it is the "least European part of Europe," a territory with difficult alphabets, distinctive architecture, peculiar social organizations, severe climates, and until recently, backward in industrialization and utilization of its natural resources.

As a realm of the European World, Eastern Europe stops somewhat short of the Arctic, but its culture is invading the Polar World with a vigor unmatched elsewhere. To the southeast it stops somewhat short of the Caspian, in territory so arid that Dry World culture patterns are practically inevitable. Important outposts of Eastern European culture, however, appear in Asiatic lands to the east. To the south the realm spills over the Caucasus into Asiatic territory between the Caspian and Black seas. The Urals lie far short of its eastern boundary, for the culture of Eastern Europe extends along the Siberian Wedge of the European world to the shores of the Pacific. This long strip narrows eastward between very sparsely settled taiga on one side and the Dry and Oriental worlds on the other. To the west it shades into the Shatter Belt, a cultural frontier where Slavs have intermingled, fought, and admixed biologically and culturally with Germanic, Hellenic, Romanic, and other peoples, including such Asiatic invaders as Huns, Magyars, and Turks.

The entire Soviet Union has an area of over 8.25 million square miles, more than twice as much as Europe, over half that of Asia, and over one seventh of the land area of the entire earth. Its Asiatic part is considerably more than twice as extensive as the part within the conventional boundaries of Europe.

The distance from the White Sea to the Sea of Azov is over 1,150 miles and that from the

Gulf of Finland to the Urals is on the order of 1,000. The plains of Russia, Turkestan, and Siberia constitute the largest flat-lying surface on earth. The most inland place in the world, more than 1,500 miles from any sea, lies in Kazakstan. No other nation has points much more than two thirds as far from salt water. Nearly half of the Arctic Circle falls within the Soviet Union. The length of coast from the boundary of Finland to that of Korea is about 15.5 thousand miles, or about 5 times the sailing distance between New York and Liverpool.

EASTERN EUROPEAN PLAIN

The cultural unity of Eastern Europe has arisen largely as a result of the flatness and extent of the eastern European plain. Here people have been subjected to severe, long winters. They have taken advantage of frozen ground for winter transportation and of rivers in summer. Sharply reduced hours of daylight during long periods of low temperature have placed distinctive stamps on Russian ways of life. Ways found satisfactory by people in one place are as likely to be suited to the habitants of places many miles away. In flat regions generally and in Eastern Europe in particular similar culture traits are widely dispersed.

The western limits of Eastern Europe appear where diversity exists in topography along the Carpathians, in the Balkans, and toward the shores of the Baltic. This is also a zone where winters are considerably milder, where the average January temperature approximates 25° F.

The flatness of the eastern European plain is such that over an area of about 2.32 million square miles the culminating elevation is but 1,062 feet. This highest point is in the Valdai Hills, some 200 miles west and slightly north of Moscow. Only a small fraction of the plain has an elevation in excess of 800 feet and over half lies below 600.

Scars of Ice Age glaciation appear to the north beyond a line extending roughly from the central Carpathians to the central Urals. This distinctive region is apparent on any reasonably good atlas

map and may be identified by the presence of numerous lakes and wet marshy (grass) or swampy (trees) areas that lie between moraines.

Rivers radiating from the Valdai Hills and the marginal highlands of the plain wind downslope with low gradients, navigability being broken only here and there by some such interruption as a ledge of hard rock capable of forming rapids. Over half of the plain drains into the Volga system and eventually to the landlocked Caspian. The next most extensive watershed drains northward into the inhospitable White Sea and Arctic. To the southwest is the extensive Ukraine, where the Don, Dnieper (Dnepr), Bug, Dniester (Dnestr), and other streams lead to the bottlenecked Black Sea. A comparatively small territory drains into the Baltic. The typical valleys of the plain are broad and shallow, though parts of some major rivers are entrenched below cliffy walls. Divides are wide and flat. When ordering a railroad between Moscow and Leningrad it is said that the Czar told his engineers to follow a straightedge that he placed across the map. They found little difficulty in doing so, almost precisely, so flat was the entire distance crossed.

Portages between Russian rivers have long served as strategic places, commercially and politically. Traders dragged boats across them for many centuries and control of trade was determined largely by their possession. Many were canalized at later dates. Especially important were portages near the Valdai Hills, where goods converged from Arctic, Baltic, Siberian, and even Far Eastern points, to be moved either southward to Constantinople or westward to the peoples of northwestern Europe.

A rather continuous belt of morainal deposits leads from Moscow, past Vyazma, Smolensk, and Vilna (Wilno), to Warsaw and the western arm of the European Plain. Though subdued and unimpressive as a relief feature, this ridge has located many portages and important population knots. Along this route have come armies of invasion from the west and, in the opposite direction, many of the main Slavic thrusts into northwestern Europe.

Rivers, the traditional means of carrying goods in Slavic territory, are still of primary importance in the transportation system. Nearly one third of all freight in the Soviet Union travels by boat. In all there are some 132,000 miles of navigable waterways. Traffic is seriously interrupted by long periods of river ice. The season of dependable navigability at the mouth of the Dnieper is but 280 days, at that of the Volga, 264, the Neva, 218,

and the Northern Dvina, at Archangel (Arkhangelsk), 177.

Roads and trails have always been poor. Concentration of rainfall in summer tends to make them muddy, but this point has been greatly exaggerated in explaining the importance of winter transportation on sleds. The main point is that few were improved or provided with adequate surfacing. Road building has been expensive in many places, particularly across marshy territory, such as is common in northern Russia. Frost attack is destructive to pavements. In 1917 there were only 3,000 miles of paved road in all Russia. Twenty years later the mileage of reasonably good highways was about 100 times that distance, but World War II seriously halted the project of building a really adequate road system, even in the European part of the Soviet Union.

Vast distances have rendered railroads expensive. Some 62,500 miles of track serve inadequately an area of over 8 million square miles. Three quarters of all Soviet territory lies more than 25 miles from a railroad. The first transcontinental line was not completed until 1900. There is little wonder that the mileage of commercial air lines exceeded that of railroads in 1937.

With poor communications, resources remain undeveloped. Where means for interchange of goods are lacking, natural endowments have little value. Russia, a land long backward in transportation facilities, contrasted sharply with the rest of Europe from the standpoint of exploitation of its resources. Under Soviet leadership developments have seemed profound, mainly because the datum from which they started was so low.

The importance of Russian trade fairs was an expression of inadequate transportation facilities. For centuries these were the main centers for buying and selling in more than 16,000 villages and cities, 85 per cent of which were in European Russia. Most fairs were held on navigable waterways. Though similar institutions were once firmly established in France and other parts of Europe, they declined rapidly after the close of the Middle Ages.

Long winter nights favor domestic industries of many kinds. People tightly cooped up in warm dwellings find it possible and profitable to spend many hours making things needed by the family, or that can be sold to others. This type of self-sufficiency means that few manufactured goods are required from outside sources. Russian peasants were traditionally the most self-sufficient people in Europe and made trifling demands on commerce in comparison with Europeans to their west. Culture traits so firmly established are long enduring.

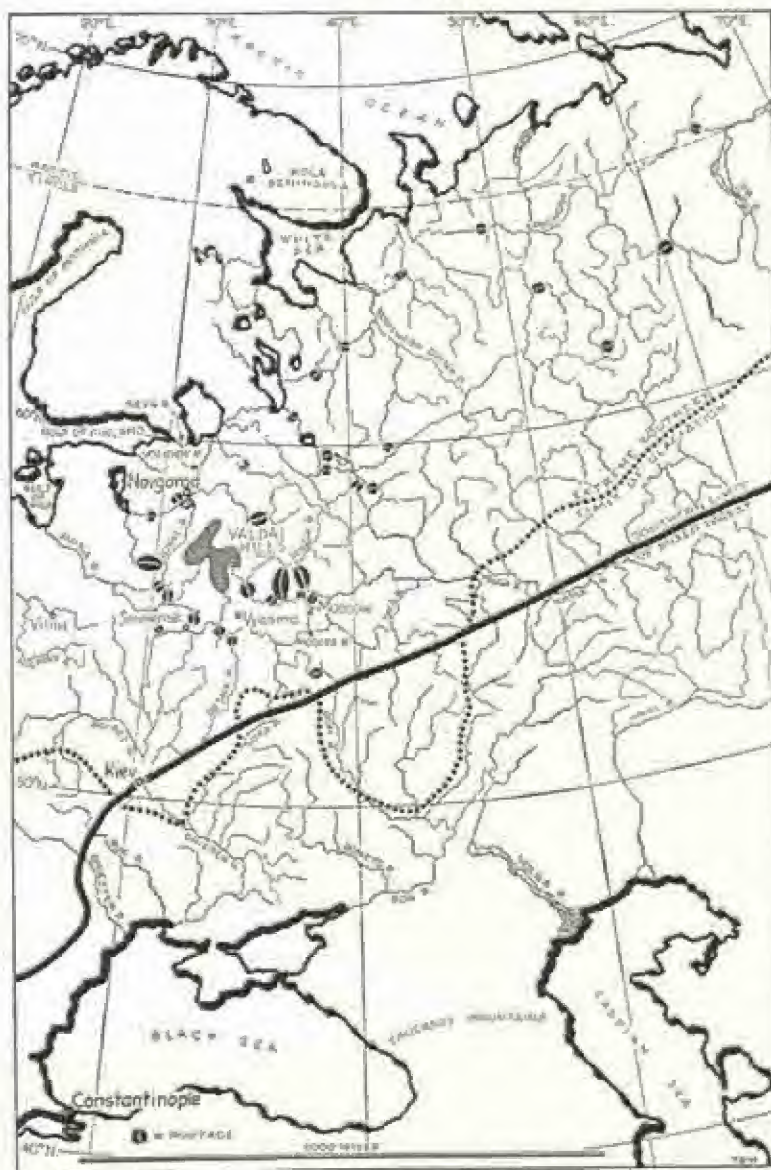
Only the westernmost part of the Russian plain receives more than 20 inches of precipitation annually, 15 being characteristic of the central and 10 or less of the eastern parts. Values are much lower toward the cold Arctic coast and also toward the Caspian. Most of the moisture that reaches the European part of the Soviet Union drifts in with summer air-masses from the Atlantic. The cover of cold, dry Asiatic air is too general in winter to permit much warm Atlantic air to spread over Eastern Europe. The most violent invasions of winter Asiatic air come as *burans*, icy-cold winds from the north and east. These sweep across the plain as blizzards, often carrying temperature down to several tens of degrees below the Fahrenheit zero. Snowfall is generally light, because the season cold enough to permit condensation of moisture directly into solid form is also the dry season. Such snow as falls is ordinarily of the non-picturesque, cold variety. It is dry and readily picked up by wind, to be blown into drifts that accumulate in sheltered locations.

European Russia exhibits a variety of vegetation belts that extends across the entire range from tundra to desert. All belts are broad on the plain and transitions between them are gradual.

Tundra vegetation covers about 27 per cent of the entire Soviet Union. In European Russia its southern boundary runs about through the middle of Kola Peninsula and the White Sea, crossing the Pechora Basin somewhat north of the latitude of 64° N. The higher elevations

of the Urals swing the tundra boundary down to about 60° N. Most of Asia north of the Arctic Circle is tundra covered, but the belt broadens where highlands exist and some arms of tundra reach as low as 53° N. in mountains toward the Pacific.

Taiga covers about 30 per cent of the Soviet Union and may include about one third of the useful softwood lumber resources of the world. The trees mature in less than 200 years and might be capable of meeting the world's main lumber demands if facilities existed to handle the trade. Some authorities dispute this notion because there



Russia: natural setting and early settlements

are large barren areas in northern Siberia, and stands of useful pine, fir, and spruce are diluted more than is generally recognized by less useful larch, birch, and alder. There can be no doubt, however, that taiga lumber resources are the most valuable on earth.

The southern boundary of the taiga runs eastward from a little north of Stockholm, across southern Finland, past Leningrad, and across the plain in the latitude of about 60° N. Increasing elevation toward the Urals swings the taiga boundary about to 55° N., which is also a rather typical latitude in crossing western Siberia. In eastern Siberia taiga dips south into the Altai Mountains below 50° N., a latitude that it approximates as far as the Sea of Okhotsk.

Mixed forest covers about 25 per cent of the Soviet Union. Coniferous softwoods are typical of hills and less fertile areas, while broad-leaved hardwoods grow in lowlands and on better soils. Conifers increase in relative abundance toward the taiga. The original distribution of mixed forest was widest in European Russia and in the Far East toward Manchuria. Across much of Siberia the southern boundary of the taiga is determined by aridity, so the vegetational transition into central Asia is one that passes from coniferous forest directly to steppe, or dry-climate grassland.

Only about one sixth of the original mixed forest is standing today and this is mainly in the Far East. About one third has been converted into agricultural land for raising field crops. Cultural landscapes are typically those in which pasture lands, fields, and wood lots alternate.

The southern boundary of the mixed forest runs from near the mouth of the Danube to the junction of the Volga and Kama near Kazan, and across Siberia to the Enisei (Yenisei) in the latitude of 58° N. The Far Eastern mixed forest borders Manchuria on the Pacific side of the meridian of 120° E.

Arid-climate vegetation covers about 18 per cent of the Soviet Union. Somewhat less than half of this area is desert, where precipitation is insufficient to maintain widespread stands of even the shortest and scantiest grasses.

The heart of the desert lies around the northern and eastern sides of the Caspian, extending broadly eastward to the margins of highlands flanking the Hindu Kush, Tien Shan, and other lofty ranges of the central Asian mountain knot.

Salt steppe borders the desert and shades into typical steppe where the climate is less arid. Some grazing occurs in the salt steppe and more in the true steppe, where short grass is abundant. Toward the mixed forest or taiga margins of the steppe

the native grass is tall. This land is ordinarily excellent for agriculture.

The vegetational transition up the sides of many of the mountains in inner Asia is one that leads from desert or steppe basins through varieties of mountain steppe to alpine tundra. Where sufficient precipitation occurs a belt of taigalike forest grows below the tundra.

The northern slopes of the Caucasus are quite arid, so that steppe vegetation rises to 10,000 feet or more. Upslope are forest and alpine tundra belts. Descent on south slopes passes from tundra through a wide belt of forest and then into vegetation similar to that of the Mediterranean, where dwarf forest and grass prevail with groves of trees restricted to limited areas that remain moist during the summer. Most Soviet territory in Asia Minor is covered by steppe vegetation.

EARLY CULTURES

To the ancient Greeks, the first explorers and commercial adventurers from the Mediterranean World to encounter Slavs, the Scythians along the northern shores of the Black Sea were classed as barbarians, an expression that ordinarily implied people of some foreign culture world. These peoples used strange languages, practiced unfamiliar religious rites, and exhibited primitive ways of life. The most learned Greek philosophers had no basis for believing that Scythia should ever be incorporated in the same culture world as the Mediterranean region of Europe. Scythians were Asiatics to people who drew the boundary of Europe along the Dnieper. Their cultural affinities were mainly Asiatic when the boundary was pushed eastward to the Don. A long, interesting history determined that eastern Europe should become a realm of the European, rather than some Asiatic, culture world.

Huns, Vandals, Magyars, Bulgars, Finns, and other peoples raided, crossed, or settled in parts of eastern Europe at early dates. Some remained to establish distinct linguistic groups. Others moved to distant lands. Many were lost and absorbed. Racial mixtures became complex, but Alpine stocks were generally dominant and most people were speaking Slavic tongues by the time that Russia began to emerge on the eastern plain.

Two main centers of cultural development arose during the early centuries of the Christian Era, one in the vicinity of the Valdai Hills and the other at Kiev. The commercial basis for these centers was mainly trade in animal pelts. Furs were the typical commodity of Russia from the time of the Greeks until well down into the eighteenth century. Forest products, such as honey

and wax, amber from the east Baltic, and slaves were incidental commodities.

By the seventh century, venturesome Nordics, Varangians from Sweden, proceeded up the Western Dvina (Daugava) in search of trade possibilities. Before long they had developed routes down the Dnieper to the Greeks of Constantinople and down the Volga to markets as remote as Baghdad. Commercial success led to political control. Novgorod-the-Great arose as a Varangian stronghold to control the Neva-Lake Ilmen-Volkhov trade route in the ninth century. A century later its inhabitants had become thoroughly Slavized.

Kiev, located on the forest-grassland boundary, between vast regions with contrasted products, on the most active avenue of trade, the Dnieper, squarely between Novgorod and Constantinople, was bound to prosper during the days of Varangian trade. Its early prosperity lasted about four centuries, until 1204, when Constantinople was conquered and sacked by Venetians during the Fourth Crusade. During these four centuries, Kiev became the main southern nucleus of Slavic prosperity and culture. Commercially and politically the Kievan state was Slavized while in Varangian hands.

Rus, a Varangian clan descended from the followers of Rurik, who ruled in Novgorod in the middle of the ninth century, determined the name of a state that pushed its frontiers and spheres of influence eastward along the valleys of the Oka and Volga and southward along the Dnieper, mainly between the ninth and twelfth centuries. Kiev became capital of Russia in A.D. 879.

The general plan followed by the Russians in expanding the Varangian-Slav state was that of building blockhouses, *ostrogs*, at strategic sites. These forts were placed at important portages and most of them were so well located that they grew to become the leading cities and towns of Russia. The intent of the *ostrogs* was primarily commercial—they were to defend trading rights—but they also turned out to be focal points for political control.

Christian influences were resulting from contacts with the Greeks of Constantinople. Toward the end of the tenth century, Grand Duke Vladimir of Kiev brought monks northward to teach Christianity. From the "mother of Russian cities," the Church henceforth marched with the soldier. Greek Christianity spread over Eastern Europe.

By the end of the Varangian period, the *ostrogs* of Vitebsk, Smolensk, Toropets, Tver, Moscow (Moskva), and other points had developed into important settlements. Nizhni Novgorod (Gorki) was founded in 1221 as an eastern outpost.

MONGOL INVASIONS

The boundary between Caucasoid and Mongoloid peoples lay to the east of the central Asian mountain knot in ancient times. The European Middle Ages began about the time that Mongoloids began to march westward, eventually as far as the Hungarian Plain. The first signs of the movement appeared as raids, or in the form of arrivals on more peaceful missions seeking new territories in which to settle. Nearly ten centuries later came great waves of highly organized horsemen bent on military conquest. The eastern part of the European Plain felt the impacts of Mongoloid invaders most forcefully. Inroads to the north were generally peaceful. The spectacular conquests centered along the northern border of the steppes, where horsemen found going the easiest.

Genghis Khan appeared with dramatic suddenness. In 1218 he arrived from across the Pamirs and during a widespread raid managed to capture the Grand Duke of Kiev. By the time of Genghis's death in 1227, Karakorum in inner Asia was the capital of an empire extending from the Pacific to the Dnieper. Conquered Europeans had practically no concept of the magnitude of the Khan Empire.

Khan Batu, grandson of Genghis, arrived in 1237 and within seven years conquered most of Varangian Russia. Poland was raided in 1241, but Mongols avoided forested lands where horses were not as well adapted to warfare as on the steppe. Novgorod-the-Great barely escaped capture. As a result it became a smoldering ember of Russian culture that later burst into flames that spread across eastern Europe to unify the land of the Slav.

Though ruthless in warfare and positive in political matters, Mongols proved, on the whole, to be tolerant captors. The Khan was supreme and all property ownership was invested in him, but the lot of the common man was probably better than it had been in the past. No hostility was evidenced toward any established religious practices. In many ways the new order brought advances. It established a uniform and rather liberal legal code, a fiscal system, and Russia's first postal system.

GREATER LITHUANIA

More serious in many ways than Mongol occupation were developments to the west. A Polish state had arisen during the eighth and ninth cen-

turies along the middle Vistula, Warsaw was its nucleus and places on the Vistula delta its frontier ports. Roman Catholicism reached its Slavic-speaking inhabitants from the west and southwest and was, in turn, passed on to the Baltic-speaking Lithuanians to the northeast. Germans were also appearing in various east Baltic ports, especially at Riga, long one of Russia's main commercial outlets. The position of Novgorod-the-Great became increasingly unhappy.

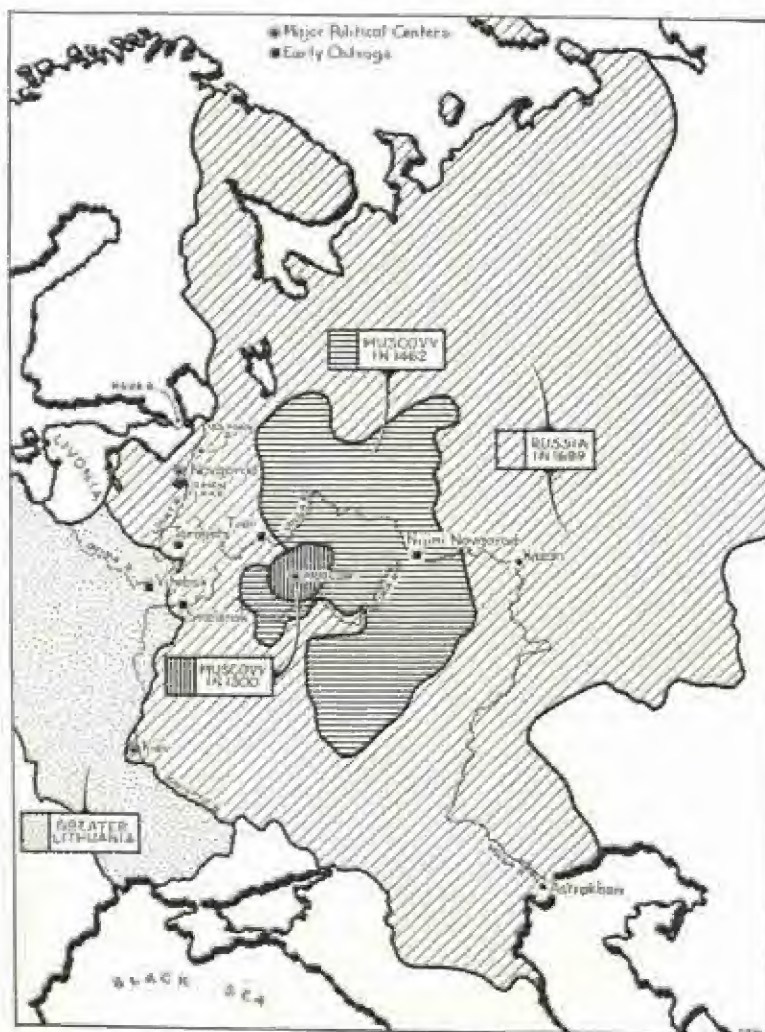
Lithuanian raiders penetrated the Valdai region during the first part of the thirteenth century. Germans filtered in to demand and receive important trade privileges from a weak Russia surrounded by enemies. Novgorod and Smolensk eventually became members of the Hanseatic League. The interests of the Germans were almost wholly commercial; they took complete charge of

all trade, even that with Constantinople and the eastern Mediterranean. Lithuanians and Poles were more interested in plunder, conquest, and opposition to the Greek Catholicism of the Russians.

From their capital of Vilna, Lithuanians extended their control eastward over much of Russia during the fourteenth century. Toward the end of the century the states of Lithuania and Poland were united under a single crown as a large Roman Catholic nation intent on destroying the Orthodox (Eastern Church) Catholicism of the Russian Slavs, with whom they fought off and on until the middle of the seventeenth century. Russians were thankful for Mongol aid in warding off the thrusts of Roman priests and generals during the early part of this history. Expulsion of Mongols, who were mainly Tatar speaking, from such centers as Smolensk and Kiev was not regarded favorably by the Russians, even though many of the victors were Slavic speaking. At its zenith, Greater Lithuania included Kievan Russia and extended to the Black Sea.

MUSCOVY

Novgorod-the-Great had many advantages from the standpoint of commercial-route control and its location proved to have strategic value enough to defy Mongol power, but it was a poor nucleus for a state. Hostile climate prevented raising crops enough to meet food demands. During its days of commercial prosperity, grain had been imported from Kievan Russia, and later from lands along the Volga. When these food-producing regions passed into Mongol hands, food supply was precarious at all times and failed completely in some years. Periods of starvation were altogether



Growth of Muscovy

too frequent. Furs, Arctic walrus tusks, silver from the Urals, and other supplies in the warehouses of Novgorod had little value to people with empty stomachs.

When waning of Mongol power permitted the rise of a new Russian state, its nucleus shifted from Novgorod to Moscow, where it remained until the time of Peter the Great.

Moscow was founded as an *ostrog* during the first part of the twelfth century in *Mezhduriechie*, the Russian "Mesopotamia," between the Oka and upper Volga. It prospered commercially, so that by the start of the fourteenth century it became the main commercial, military, and political center in the Moskva Valley.

Muscovy, the territory dominated by Moscow, had fared well under Tatar khans, who made it a center for such political activities as collecting tribute from surrounding areas. A large number of Russians had risen to important posts; political acumen had developed in Moscow, so that it became the rallying point for activities designed to wrest control from the Asiatics. In 1380, Grand Duke Dmitry of Moscow led other Russian princes in an attack that resulted in the defeat of Khan Mamay, the first great step toward liberation. It was not for another century, however, that the Mongol yoke was entirely broken. When that time came, Muscovy was the heart of Russia.

With the capture of Nizhni Novgorod in 1394, Muscovy gained control over a large part of the Volga trade. During the first half of the fifteenth century, Muscovites opened new roads to the Arctic and to the Siberian taiga. Furs, wax, walrus ivory, and other products were arriving in greater abundance. Honey filled Moscow's warehouses. The importance of honey from before Biblical times until sugar making became established can hardly be overemphasized.

Kazan blocked Muscovy from free trade along the lower Volga. Novgorod-the-Great long stood in the way of trade with the Baltic. Germans, Swedes, and other hostile peoples lined the shores beyond. Lithuanian power extended far along the coast of the Black Sea. The expansion of Muscovy into the Russian Empire became mainly a struggle for seacoasts. Russian history has been written in terms of "Urge Toward the Sea."

Ivan III, "the Great," turned attentions toward Novgorod. Taking advantage of the fact that Roman Catholic Poles and Lithuanians were in political control of an Orthodox Catholic population, Ivan subdued the city in 1471, with help from its own population, a "fifth-column" venture that has been widely acclaimed. Next in line was Tver (Kallnin), which fell in 1485. By 1492, Ivan was interfering in Lithuanian and Polish affairs.

East Slavs were becoming more powerful than their old foes, the West (or North) Slavs.

The fall of Constantinople to the Turks in 1453, suddenly left Moscow as the greatest center of Greek Orthodoxy and the spiritual heir of the Eastern Church. Ivan adopted the double-headed eagle as his symbol, when no descendant of Constantine remained to rule in Constantinople and Moscow became a "third Rome." The support of all Eastern Christians inclined to swing toward Moscow, the leading defender of their faith. It was with such backing that Ivan III had ascended the throne in 1462. Muscovy was consolidated and ready to expand into the Russian Empire.

Ivan IV became known as *Grozny*, a term ordinarily translated into English as "the Terrible." Though this description fits many of his acts it is not wholly in line with the Russian concept of the term. It might also be applied to God, in the sense of his being omniscient, or awe-inspiring. With reference to Ivan it carried mainly the idea of greatness and power. It was Ivan who first adopted, in 1547, the title, Czar (Caesar). His rule was so long, from 1533 to 1584, and Muscovy had become so powerful that his time witnessed a substantial start toward empire.

Ivan's greatest successes were eastward and southeastward along the Volga. Kazan was subdued in 1552 and Astrakhan, on the Caspian, in 1554. His fortune failed in westward ventures. The Livonian War, 1558-1583, an attempt to establish a Baltic outlet, was disastrous from the Russian standpoint. Though Russia spanned Europe from north to south at the time of the Czar's death, it was barred from western commerce by peoples under Swedish and German control and felt the pressure of unfriendly Slavs in Poland.

ROMANOV EXPANSION

The early Romanovs, starting in 1613, proved to be capable rulers and also had considerable success in expanding the Russian Empire. The Ivans had established Russia firmly as part of the European World; the Romanovs determined the extent of the Eastern European culture realm. They advanced the boundaries westward, mainly at the expense of the Poles, southward into the Ukraine, and eastward across Siberia.

A curious development occurred among Russians that led to the forming of a distinctive cultural group: the Cossacks. The term stems from *Kazak*, a free man, a Russian beyond the borders of the state. Men were recruited to fight Tatars by Tatar methods. A high excellence in horsemanship

evolved. Ranks were swelled from many sources. Criminals, vagabonds, fugitives of all sorts, and the persecuted were given permission to join this "foreign legion." Most recruits stemmed from Muscovy, but ranks were swelled by Poles and Lithuanians, especially from the serf class or others anxious to escape from their overlords. Many Asiatics joined the motley crew. After overcoming Tatar resistance in the southeast, Cossack activities turned in other directions. Some began raiding and exploring lands beyond the Urals. Others turned toward the Ukraine, partially freed of Tatars during the days of Greater Lithuania, where they established themselves as Dnieper Cossacks. Between 1637 and 1680, they turned to the basins of the Don and Donets, which they secured and where many remained to become Don Cossacks.

Russians had exploited the lower Ob at least as early as the fourteenth century as raiders interested in obtaining furs. Yermak and other raiders went further, so that considerable knowledge of Siberia had been obtained before the end of the sixteenth century. Ostrogs were established at Tyumen (1586), Tobolsk (1587), and Tara (1594). These were Muscovite outposts. The more

serious plan of developing Siberian commerce was initiated by the Stroganov family and taken over by the government. Politics followed the search for pelts of otters and sables. By 1626 the valley of the Enisei was fully under Russian control. The lure of wealth from furs or other sources continued to urge men eastward. The continental divide was crossed by 1639, and Dezhnev, a century before Bering, discovered the fact that water separated Asia from North America, in 1648. Priests and monks accompanied the traders. A Diocese of Siberia was established in 1620 with its seat at Tobolsk, which had then become something more than a frontier fort.

The greatest territorial success westward was achieved under Peter the Great, who by the Treaty of Nystadt in 1721 secured control over Karelia, Estonia, Livonia, and part of Finland. With shores of the Gulf of Finland in Russian hands, a Baltic foothold had been firmly established. Under Catherine II, "the Great," further gains were made against Poland. War with Turkey, in 1768-1774, gave Russia a great length of Black Sea coast.

Seizure of Amur territories from China in 1858 and expansion beyond the Caucasus at various rather late dates, completed the Romanov expansion of the Russian Empire.

15: U.S.S.R.: Cultural and Political Evolution

The patterns of eastern European culture arose and evolved during the gradual emergence of the Russian state. Many cultural facts and traditional attitudes in the Soviet Union today are understandable only when associated with their historical backgrounds.

The main linguistic division of the Soviet Union, that between Great Russian and Little Russian, is a sharp break in many ways. Cultures to the north were developed by rather pure Slavic stocks of the mixed forest, while those to the south arose among blended peoples of the Cossack steppe lands, who remained under Polish rule until 1648. The contrast is so great that the boundary between the two leading republics of the Soviet Union follows closely the linguistic break.

A strong tradition of individual ownership of property was slow to arise among a people who had long known a system of khan ownership in which individuals generally fared well. Lands rather easily passed into the hands of the aristocracy after the end of Tatar control. With the ruling class liquidated, the extreme form of socialism that exists in the Soviet Union is neither particularly novel nor irksome.

The strong strain of Mongolian influence in eastern Europe was well rooted in the court-ruled orthodoxy of the Eastern Church, long in the hands of such aristocrats as Ivan IV who dominated nobility and clergy according to Asiatic patterns. It awaited Peter to give attention to the abandonment of Tataric traditions and the adoption of European ways. Mongol-inspired beards were shaved off the faces of nobles. Asiatic dress was abandoned in favor of European costumes. Marriage contracts were arranged between the individuals concerned rather than by parents or families as in eastern Asiatic lands. These reforms were comparatively recent; Peter's reign lasted until 1725. With the establishment of St. Petersburg as a march-site capital on the fighting front of his empire, Peter turned Russia's outlook westward in so far as he was able. He had released his court from Mongoloid Moscow with its mysterious, walled inner city, the Kremlin, which in some ways resembled the sacred inner city of Peking.

ROMANOV SOCIAL REFORMS

Eastern European society, during the long interval following the decline of Tatar rule, evolved a lord-and-serf system where over 90 per cent of the land belonged to a few families of nobles, and most of the population occupied a position little better, if indeed as good, as that of slaves. Serfs might be attached to the land, or to individual households. If unruly, they could be banished to Siberia. Those fortunate enough to escape the system gladly fled to Cossack territory—to the "wild east," where they might become incorporated into a society of more or less "free men." The system provided no middle class.

Wherever the Romanovs made territorial gains, the lord-and-serf system also spread. When, under Catherine, the empire was expanded southward, some four million peasants lost their freedom, mostly in the Ukraine. In many ways most Little Russian-speaking people had fared better under Poles or other foreign rulers.

Most of the succeeding Czars were anxious to remedy Russia's medieval social and economic conditions. Their aims were not altruistic as a rule. The real intent of their reforms was ordinarily that of destroying the power of the nobles, who proved to be an almost constant source of irritation. Most of the efforts toward reform were ineffectual because the nobility profited greatly by the old system. Some czars were stronger than others, however, and certain events may be regarded as milestones along the road of reform.

Alexander I liberated the serfs of Finland and the Baltic Provinces, 1803–1816. Nicholas I instituted such reforms as preventing the breaking up of serf families by sales of land, and the transfer of serfs to lands insufficient for their maintenance. It was under Alexander II, between 1857 and 1864, that the first really sweeping reforms occurred. The Act of Emancipation of 1861 freed the serfs unconditionally. It broke large estates into smaller units by providing that sales be made to *mir*s (villages) with payments of 5 per cent annually to former owners.

The introduction of the *mir* system changed landscapes enormously. Great numbers of the

nobility went to cities or built palaces along the attractive coast of the Black Sea, in Crimea, and south of the Caucasus, where they could live luxuriously on the proceeds from the forced sales of their properties. Others turned to commercial pursuits or to industry. The first sign of the Industrial Revolution in Russia appeared when the nobility lost their estates. Urban landscapes began to change appreciably.

The *mir*s set aside certain tracts of land as *communes* under joint ownership for such purposes as common grazing ground. Individuals received strips to be worked personally as if they were their own. Rye and wheat were raised as cash crops, but most people lived about as poorly as they had under landlords. Life had not changed greatly; freedom to leave *mir*s was not gained as a right for many years. Former house serfs were left landless to degenerate into the very lowest stratum of society.

Gradual reform of the *mir* system culminated in 1906 when each peasant received his own share of communal land. European ideas of land ownership had become thoroughly established in theory, but only a few grasped the real significance of the change.

By 1917, 1.5 million Russian peasant families were settled on their own land. During the period of reform since 1861, a new social contrast appeared in the rise of a new class, the *kulaks*. Some peasants worked harder than others, became better farmers, had more financial acumen, enjoyed better luck, or for other reasons proved more capable of acquiring money and land than others. These *kulaks*, or wealthy peasants, in remarkably few years often gained control over vast estates, so that they ascended to about the same rung on the economic ladder as had the nobles before the days of liberation. The overwhelming majority of serfs and their descendants remained on lower rungs, generally in their traditional state of poverty.

Nothing resembling the middle class of western Europe ever developed in Russia. Many members of the old nobility amassed fortunes in industry. *Kulaks* rose to a similar financial status in rural regions. The greater proportion of the population lived on a plane not far above that of destitution. By 1917 Russian agriculture was just about on a par with that of western Europe during the Middle Ages. A surplus of wheat, flax, hemp, and sugar was being produced, but on an extremely low-yield basis. Russian fields, many of which have the richest soils in Europe, were turning out

such yields as 8 bushels of wheat per acre, while western Europeans, under rather difficult conditions, commonly made a return of 25, 30, or even more.

SETTLEMENT OF THE STEPPE

The people of Great Russia in the mixed forest belt had never been able to raise their own food. During some ten centuries they had depended on the fertile soils to the south along the borders of the forests. Their exports made this condition possible. Boats loaded with furs and other northern products returned with cereals. Novgorod-the-Great and Moscow both rose to greatness on Kievan food. Mongol conquests reacted severely in cutting down food supply. Tatar rule was hostile to food production as were Cossacks, who developed such dependence on horses that they would kill anyone who attempted to plow their grazing lands. Up until the year 1500 there was not one permanent settlement in the "savage steppe" of the Cossacks.

With subjugation of the Ukraine, under Catherine, came the opening of the grasslands to settlement. New lands were thrown open to plowing and peoples were attracted in great numbers, and from afar. Little Russian agriculturalists moved southward from forest borders to grasslands. Great Russians, hearing tales of soil fertility, left their gray, sterile *podsol* soils and moved overland to the black, fertile *chernozem* of the steppe. Edicts promulgating religious toleration attracted such peoples as Mennonites and Jews.

The German element was particularly strong in relation to other non-Russian emigrants. Mennonites and members of other than Roman Catholic or Lutheran churches had come in for a good deal of persecution and unfavorable discrimination at home, so that they were glad to leave for lands offering religious freedom. Great numbers went to the United States, and many to Russia. Even those who belonged to the more popular churches felt the attraction of greater economic opportunities abroad. As a rule, Germans settled in groups. Their presence is still evident in several parts of Texas, Missouri, and other places in the United States. In Russia they went mainly to the Great Bend of the Dnieper, territory between that bend and the Sea of Azov, and to the middle Volga, where they retained their native tongue. Some of the Volga Germans later migrated to Mexico, Canada, and other lands, bringing a culture that is essentially Germanic but with considerable Slavic admixtures. During World War II, the Germans along the Volga

were moved en masse to places east of the Urals.

The land rush to the Ukraine and the steppes beyond along the middle Volga, was paralleled in many ways by events in the United States that took place during about the same period. Americans had discovered, after clearing forests tediously in such places as western Virginia, Kentucky, and Tennessee, that an old European belief that the best lands support forests, particularly oaks, was erroneous. The best lands west of the Appalachians were growing native grass. Open prairies had only to be plowed and seeded to be brought into production. The Cossacks and various Mongoloid peoples of the Russian steppe had their counterparts in the American Indians, who stood by to see old ways of life disappear and new ones appear with revolutionary suddenness. Some were absorbed into the new culture, others were displaced to lands beyond, while many simply perished as a result of inability to become adapted to the new methods of land utilization. In both the Russian and American instances the movement to the grasslands was carried too far. People went across the best areas into marginal territory where years of precipitation deficiency meant loss of crops, disaster, or even starvation.

REVOLUTION

The Revolution of 1917, which ended the period of Romanov rule and substituted governments with extreme forms of socialism in their ideologies, upset agricultural productivity completely. The kulaks were promptly liquidated. The lower social strata left cities in droves to overpopulate rural lands. Farming conditions became chaotic. It was not until after five years of civil war and invasion by foreigners interested in crushing "Bolshevism" or "Communism," that any semblance of law and order appeared. There were really several revolutions in rapid order. In the end appeared the Soviet Union, but it took several years of hard work and careful planning before agricultural, commercial, or industrial output began to approach 1913 levels. Many of the changes that appeared had profound effects on the landscape.

The system of *kolkhozes*, or collective farms, was established in 1928. It expanded so that by 1939 over three quarters of all peasants had become incorporated into the plan. It achieved the goal of reasonable agricultural stability and productivity.

Under the collective system, farming is visualized as being susceptible to organization along industrial lines. Land is pooled in large tracts and

is operated by specialists. Persons who drive tractors are trained for the job and do just that. Others repair machines in large shops with reasonably good equipment. Planners decide upon the kinds of crops to be grown. Trained superintendents oversee the operations. Each person engaged in the enterprise benefits financially if the operation has been successful and according to the service he has rendered. Governmental research organizations are heavily subsidized and experiment constantly to make the system more effective and more productive. The system has worked well. Of the half-million tractors in the Soviet Union in 1937, over 236,000 were on collective farms and were being serviced by nearly 7,000 repair stations. Farming had been raised to a level where the individual no longer was required to become a Jack-of-all-trades.

In addition to the collectives, were *sovkhozes*, or large farms operated by state governments. The Giant, near Rostov, has an acreage in excess of one-half million. The idea of industrial organization is carried further than on the collectives. All workers are paid by the government. No risks are taken by the individual. This system has considerable merit on marginal lands, as in the drier parts of the steppe and in more remote parts of Siberia, where crop failure is a possibility in any year and probability in a fair share of years when rains fail to come at the right season, or when new insect pests appear.

Though the risks that have ever plagued the agriculturalist were largely removed by the *kolkhoze* and *sovkhoze* systems, it was found that their organizations had overlooked an important trait of most peasants, frugality. A peasant is ordinarily willing to work and sacrifice to the utmost to better his own financial position. A certain living, without the prospect of betterment through thrift, lacked an appeal that was felt keenly. For this reason a "New Economic Policy" was instituted which provided that peasants could obtain certain parcels of land to be worked outside of hours required on the collective or state farm, and from which they could retain all profit.

The provisions of the New Economic Order are carefully designed to prevent the rise of another kulak class. A peasant may take as much ground as he alone can cultivate. He and his heirs may use the land until such time as they fail to keep it producing; whereupon it reverts to the state and all rights are forfeited. Land is lost and heavy penalties incurred if a peasant is found to be using the services of another person on his

tract. He is permitted to keep a certain number of chickens and livestock personally, but loses all if at any time he exceeds his quota. The profit incentive is back with the peasant, but in a form that prevents the accumulation of substantial wealth.

In 1941 there were nearly a quarter-million collective farms operated by nearly 19 million families. The cash incomes of the collectives increased more than threefold between 1933 and 1939. The state farms have been evolving into large agricultural experiment stations. In spite of the emphasis given to these semi-industrialized forms of farming, nearly 1.5 million peasant families still remained on individual properties.

Soviet industry, with a few extremely trivial exceptions, is state owned. About a million youths of 14 years or more are drafted each year for training and four years of industrial work. Incentive pay is offered for production in excess of individual quotas, and occasionally someone who performs some prodigious feat is decorated by the government and given substantial extra privileges.

The chaos between 1917 and 1923 brought industrial collapse. The level of 1913 activity, used as a standard because it was the last year before the outbreak of World War I, was not regained for many years. The main upward spurts were the result of two "five-year" plans. At the end of the first, which was completed in about four years, in 1932, the industrial output was about 3.5 times that of 1913. It rose rapidly until World War II, having increased about sixfold in ten years. The War dealt it a crippling blow and changed its orientation materially, mainly in the direction of rehabilitation. In 1946 Russian industry stood about where it was in 1928 when the first five-year plan was put into execution. It was not expected to reach pre-World War II levels until about 1950. Under the goals set by the first postwar five-year plan of 1945, the per capita industrial strength of the Soviet Union should approximate one quarter that of the United States. The Soviet Union is not an industrial giant.

Soviet industry has been extremely slow in providing such elemental needs as clothing and housing. In 1939 less than half as much cotton cloth, less than a quarter as much woolen cloth, and only one third as many shoes were being manufactured as in the United States, to be distributed among a population 50 million in excess of that of the United States. Cement manufacturing was at about one third the United States level. Housing was in such demand that marriages were commonly de-

ferred for months or years, until one mate might find some sort of habitation, which was likely to be nothing more than a single room with privileges of sharing facilities for cooking, washing, and sanitation with a large group of other people. World War II left some 25 million people entirely homeless. The problems of rehabilitation are enormous, but the goal of the current five-year plan is to have them solved before the plan is half completed, on a level, of course, that would strike us as being extremely low.

The greatest industrial gains made in the Soviet Union were in the direction of heavy industry, yet the output was low by United States standards. Russia by no means became an industrial giant and presents no prospect of becoming one until well after 1960 even if progress is uninterrupted by war or other setbacks. From coal production of 182 million tons in 1940, planning calls for an increase to 275 million in 1950 and about twice that in 1960, or a figure 100 million tons below the United States output in 1944. By 1950 the planned petroleum production amounts to about one seventh that of the United States in 1944; in 1946 it stood at about one tenth that of the United States. Electric power is produced at about one quarter of the United States output. Steel production in 1946 stood at about one seventh. By 1950 it was planned to reach about one sixth of United States capacity. The inadequacy of the Russian transportation system is shown by the fact that during the current five-year plan Russia proposes to build less than 10 per cent as many locomotives as the United States built in the single year 1929.

Developments since 1917 brought many radical cultural changes and many that are rather natural in the light of Russian historical experience. One of the changes was that of turning the face of Russia eastward again. The gestures toward Europeanization made by Peter in the eighteenth century were to a great degree effaced. The capital was removed from its Baltic outlook to the inner city of Moscow. A wall against economic and cultural intercourse was erected toward Europe. The "least European part of Europe" was directed along roads calculated to make it even less European.

Though the revolutionary period proved ruthless toward human life in many ways and hardships were intolerable for most people, there was present at least a shadow of the influence of Yelü Chutsai, the great statesman who seems to have been responsible for Mongolian tolerance toward religion, culture traits, and culture heritages. The Russian revolutionists spared generally such things as churches with the treasures they had accumu-

lated, libraries, museums, palaces, and mansions with all their contents. Plundering seems to have been absent. Though official policies were anti-religious for many years, many churches were permitted to continue their activities. An active program was instituted to preserve the languages, names, customs, and culture traits of minority groups.

PEOPLES

Some 185 different "nationalities" are officially recognized in the Soviet Union. About 78 per cent of the population falls into the "Russian nationality." In general, the term "nationality," as used in the Soviet Union, refers to a linguistic group of some size, but it is not wholly synonymous. There are also official recognitions of "languages," and the number vastly exceeds that of "nationalities." The relative numbers of people included in the leading "nationalities" are indicated in Table 8.

Table 8 Major peoples of the Soviet Union

	Percentage of entire Soviet population
Russians	78%
Great Russians	58%
Little Russians	17
White Russians	3
Non-Russians	22
Turks and Tatars	14
Finnic peoples	3
Jews	2—
Various Mongoloids	1
Germans	1
All others	1+

Table 8 is presented in extremely simplified form and lumps various racial and linguistic groups in the mixed sort of way that is currently popular. It is purposely labeled "peoples," because that title comes closest to describing the groupings it contains. In general, the groupings are cultural. The "various Mongoloid" category possibly includes the greatest number of internal contrasts. It refers to non-Turkish, non-Tataric population, which occurs mainly to the east of the great plains of Turkestan and Siberia. Some of these peoples inhabit the high mountains of central and eastern Asia, others are tribes in the taiga, and many are Chinese or other Far Eastern Mongoloids.

Jews live mainly in a belt extending from the eastern corner of the Baltic to the western corner of the Black Sea. Nearly 60 per cent live in the Ukraine, 22 per cent are in Great Russia, 15 per cent in White Russia, and 4 per cent are scattered

elsewhere. In some formerly Polish territory they constitute as much as 14 per cent of the total population.

Some 300 different written languages exist, about 85 of which have some importance, though books have been printed during recent years in 111. Newspapers are currently printed in 69. Education in universities and schools of higher learning is conducted in 22 main languages into which all standard text books are translated. Linguistic variety is encouraged, rather than prohibited; a type of tolerance that is decidedly more Asiatic than European in tradition.

It is now claimed that the entire population of the Soviet Union is literate. About 10 per cent have advanced beyond the standard seven years of schooling. Local educational facilities have been provided in even the most remote parts of the Union, and education is carried on in the native tongue. It was necessary to create 50 new alphabets for minorities that had never had a written language. These were mainly adaptations of the Latin alphabet rather than the Cyrillic alphabet of the Russians themselves. At the head of the educational system are more than 730 schools of higher learning. Possibly 30 of these may be considered to be universities, the others are colleges, technical academies, and terminal schools of various specialized kinds.

As a result of the Baltic conquests and territorial expansions effected during World War II, the entire population of the Soviet Union is in excess of 200 million. Its annual rate of net increase is somewhat over 3 million, which is about that of Europe west of Russia.

Soviet society is divided into three main classes: peasants associated with collectives or other large-scale farm enterprises, 46 per cent of the population; peasants and others who are not engaged in collective farming or industry, 22 per cent; and industrial workers, 30 per cent. Some 2 per cent of the population consists of nonworkers in the appraisal of Soviet eyes.

POLITICAL ORGANIZATION

The Revolution of November, 1917, proclaimed Russia a republic. The empire had collapsed in March. The Revolution of November established the Soviet Government. By 1920 Red Soviet armies had successfully overcome "White" armies in Crimea, Siberia, Estonia, and Galicia. Territorial adjustments finally resulted in the loss of Finland, Estonia, Latvia, Lithuania, and a portion of Poland. A strong attempt was made

toward Ukrainian independence, but loss of Russia's "bread basket" would have ended all prospects of Soviet success. The Red army managed to oust the provisional government of independent Ukraine in 1919. Georgia, beyond the Caucasus, and Armenia were conquered in 1921. Gains resulting from the Finnish War and World War II added a strip to the western side of the Soviet Union extending from the Arctic to the mouth of the Danube. The most important acquisitions were lands from Finland, the Baltic States, part of East Prussia, a large share of eastern Poland, and the northeastern part of Rumania. Beyond the belt of actual territorial gain a wide zone, practically coincident with the Shatter Belt, of Soviet-controlled governments was established for "security purposes." In possibly the same category is the Soviet Zone of Germany.

The Union of Soviet Socialist Republics consists of 16 separate republics, of sizes indicated in Table 9.

In Table 9, all land occupied as a result of World War II has been credited to the Russian Socialist Federated Soviet Republic unless its political status has been determined definitely other-

wise, as for example, the addition of the northern part of formerly Rumanian Bukowina and formerly Czechoslovakian Carpatho-Ukraine to the Ukrainian Soviet Socialist Republic. For comparative purposes, the area of the United States is about 3,088 thousand square miles and non-Soviet Europe is 1,637. The vast size of the federated republic is misleading. Within it are included the entire tundra and taiga territories of both European and Asiatic Russia and vast stretches that are hardly inhabited.

In theory any republic within the Soviet Union has a great deal of independence, even the right of secession and full power to enter into relations with foreign states and to make treaties with them. The three leading European soviet republics have been recognized by other nations to the extent of having been given individual representation in the United Nations. There is, in actuality, considerable variation among the republics in local matters, but it is no more likely that one would leave the Union than for a state to secede from the United States. The bond between soviet republics is far more than one of compulsion. It has been severely tested by war and proved enduring.

The populations of each of the 16 soviet republics in 1946 are shown in Table 10.

Table 9 Approximate areas (1946) of individual republics in the Soviet Union

<i>Predominantly European World</i>	
	<i>Area, thousands of square miles</i>
Russian S.F.S.R.	7,924
Ukrainian S.S.R.	181
Belorussian S.S.R.	80
Karelo-Finnish S.S.R.	16
Estonian S.S.R.	18
Latvian S.S.R.	25
Lithuanian S.S.R.	23
Moldavian S.S.R.	19
Georgian S.S.R.	27
	<u>8,313</u>

<i>Predominantly Dry World</i>	
	<i>Area, thousands of square miles</i>
Armenian S.S.R.	12
Azerbaijan S.S.R.	33
Kazakh S.S.R.	1,048
Kirghiz S.S.R.	76
Uzbek S.S.R.	66
Turkmen S.S.R.	17
Tadjikistan S.S.R.	55
	<u>1,307</u>
Predominantly European	<u>8,313</u>
Total, Soviet Union	<u>9,620</u>

Table 10 Approximate populations (1946) of individual republics in the Soviet Union

<i>Predominantly European World</i>	
	<i>(millions)</i>
Russian S.F.S.R.	109.28
Ukrainian S.S.R.	39.76
Belorussian S.S.R.	10.37
Karelo-Finnish S.S.R.	.47
Estonian S.S.R.	1.13
Latvian S.S.R.	1.95
Lithuanian S.S.R.	2.88
Moldavian S.S.R.	3.46
Georgian S.S.R.	<u>3.42</u>
	<u>172.82</u>

<i>Predominantly Dry World</i>	
	<i>(millions)</i>
Armenian S.S.R.	1.28
Azerbaijan S.S.R.	3.21
Kazakh S.S.R.	6.15
Kirghiz S.S.R.	1.46
Uzbek S.S.R.	6.28
Turkmen S.S.R.	1.25
Tadjikistan S.S.R.	<u>1.49</u>
	<u>21.12</u>
Predominantly European	<u>172.82</u>
Total, Soviet Union	<u>193.94</u>

16: Russian Cultural Landscapes

The part of the European World that has undergone most profound landscape changes in recent years is the Eastern Realm. It had reached only comparatively low rank commercially and industrially by 1914, at the start of World War I, and was even worse off in 1917, when its major political revolutions began. Even common products of western civilization had not been available and were known only to the more privileged classes. These were grouped in a few urban centers. The great masses of people were living close to nature, in ways considered extremely primitive by western Europeans. On the whole, natural landscapes had been changed by man only about as much as those of western Europe in medieval times.

After the political upheaval, and mainly since 1923 when conditions were stabilized, came changes somewhat equivalent to those of the combined Commercial, Industrial, and Agricultural revolutions of Northwestern Europe, and with them a vastly more concentrated urbanization. Landscapes were changed more in two decades than those of most Northwestern European countries during a century. An index of this cultural revolution is increase in urban populations. Table 11 gives a number of representative examples.

Table 11 Growth of Soviet Cities

	Approximate population (millions)			
	1913	1946 estimate	Gain	Ratio to 1913
Moscow	1.817	4.137	2.320	2.3 (times)
Leningrad	2.100	3.191	1.091	1.5
Karkhov	.248	.833	.585	3.4
Baku	.225	.809	.584	3.6
Gorki	.109	.644	.535	5.9
Stalino	.049	.462	.413	9.4
Sverdlovsk	.075	.426	.351	5.7
Stalingrad	.100	.445	.345	4.5
Rostov	.200	.521	.321	2.6
Tashkent	.272	.585	.313	2.2
Kiev	.590	.846	.256	1.4
Novosibirsk	.071	.278	.207	3.9
Tiflis	.327	.519	.192	1.6
Khabarovsk	.051	.199	.148	3.9
Minsk	.105	.239	.134	2.3
Vitebsk	.104	.127	.023	1.2
Odessa	.630	.604	-.026	.96

Four types of urbanization are indicated in Table 11. They are so distinct that only one city fails to be placed in its own category when the 17 places are listed according to order of net gains between 1913 and the latest official estimate available in 1946.

At the head of the list are the giant conurbations, the larger in each instance being the capital of its time. In spite of huge populations they grew respectively to 1.5 and 2.3 times their 1913 populations.

Next in order are thriving industrial centers. To these might be added a host of places that had insignificant populations in 1913. Spectacular among such is Magnitogorsk founded in 1931 and a city of about 170,000 at present. Within this group are the great beneficiaries of Dnieper power developments, Dnepropetrovsk, 0.501 million, and Zaporozhie, 0.289. Many old *ostrog* centers show similar growth characteristics, having increased their populations from about three to six times their 1913 levels to sizes varying from about 250,000 to 400,000. In general, the second group of places in Table 11 exhibits the growth characteristics of more favored cities below the giant category.

In the third group, with the exception of Kiev, are old and important centers beyond the limits of European Russia. The growth ratios shown vary from 1.6 to 3.9 and are generally below those of thriving industrial cities. Substantial increases have occurred, many of which would be considered spectacular by western European standards, but they are not the amazing developments characteristic of places where cultural revolutions have struck with hardest impact.

The cities at the bottom of the list, together with Kiev, show the slowest growth rates. Odessa even has declined a slight amount. These places all lie toward the western border of the Soviet Union. They were denied the financial backing that made spectacular urbanization possible for the very reason that they might prove indefensible in case of war with Germany. The wisdom shown in urban planning on the part of the Soviet government was confirmed by actual events, except that the German invasion penetrated somewhat farther than anticipated into districts where

some of the thriving industrial cities were located.

From the standpoint of cultural landscapes, the most striking changes have occurred around the giant cities and those showing the most substantial population gains. The zone toward the Shatter Belt experienced less radical change.

The Eastern Realm of the European World is making more rapid progress in the invasion of other culture worlds than any other part of the European World today. In this regard it is crowding a cultural upset in many ways equivalent to the New World Revolution into an interval of a very few years. The territory involved is mainly within the Soviet Union itself in Polar World and Dry World areas.

POLAR WORLD INVASION

Exploration of the Russian Arctic coast dates from 1577, when Oliver Brunel, a Dutchman, sailed eastward as far as the Ob. Nordenskjöld, a Swede, completed a trip from west to east along the entire Siberian coast in 1879. In all such early trips boats were allowed to freeze in the sea ice during winters. It was not until 1932 that Professor Schmidt, a Russian, succeeded in making the whole trip in a single season.

Under the leadership of Professor Schmidt and his colleagues in the Arctic Institute of Leningrad, the Arctic route has gained true commercial significance. Icebreakers of advanced design open sea valves under their fore-decks, partially submerge, and underrun the edge of the ice; after which they pump the water out, rise, and crack the

ice for a considerable distance. Ice and weather patrols keep careful check on all leads and open waters. Intensive use of cleared channels keeps them open for reasonably long seasons. Since 1935 these efforts have paid huge commercial dividends. Siberian products reach Europe in quantity.

The significance of the Arctic route lies partially in the fact that the distance by sea from Murmansk to Vladivostok is about 3,000 miles



Soviet industrial centers

shorter than that from Odessa to the eastern Siberian port. More important, however, is the opening up of outlets along some 2,500 miles of coast, with over 10,000 miles of navigable rivers that wind back through the world's largest reserve of useful timber.

European penetration of the Polar World consists principally of Arctic outposts, such as ports where rafts of logs are collected and loaded on ships, mining communities, and scientific stations. Great efforts have been made to make these outposts self-sustaining, but most of the food and other needs of the Europeans must be imported from places south of the taiga.

Various administrative centers have been established, mainly for the purpose of improving the living and economic conditions of the natives. While Europeans may be present, every effort is directed toward making such posts autonomous and toward placing them in native hands as soon as possible. In more favorable places a limited amount of agriculture has been introduced, but the economic mainstays of the Polar World peoples are fishing, trapping, and, especially, the reindeer. The government has encouraged reindeer "farming," rather than the primitive herding practiced by so many of the Asiatic tribes. It has established schools widely—for everyone.

TAIGA INVASION

The Russian *Drang nach Norden* has been concentrated in the taiga. European Russia is about one-third tree covered, with a greater area of forest than in the rest of Europe combined. About 70 per cent of Soviet timber resources lies in the taiga. Throughout most of history this belt has been penetrated by people from the south in search of furs. This activity continues, but exploitation at present is concentrating on timber.

Up until about a century ago the taiga served as a broad and almost complete barrier between culture worlds. Europeans rarely penetrated more than its southern fringe and Polar World tribes its northern, so that the great interior of the vast forest was almost uninhabited. To the Polar World it was a region where reindeer found shelter, but poor grazing, and could be lost readily. It is the European who has made the inroads.

European field agriculture is difficult under the hostile climatic conditions and on the sterile, gray soils of the southern taiga. It is impossible over about the northern half of the belt. Furs, minerals, hydroelectric power, and timber, as well as Russia's great need for seaports, have been the main attractions in the Soviet taiga, but population density is still very low.

Archangel (Arkhangelsk), on the White Sea, is the great city of the northern taiga, with a



Siberian taiga (Enisei River) (American Geographical Society)

population approaching 300,000. Its appearance suggests a latitude much farther south. Excellent buildings, paved streets, modern streetcars, an attractive opera house, and a large park "of culture and rest," are thoroughly European. A short distance to the north, however, is the tundra and marginal to the city are clearings in the forest that have not developed into the suburban zone which would surround a similar city in lower latitudes. Agriculture furnishes vegetables rather than cereal crops, a very large proportion of the produce coming from hothouses. Most food arrives by rail or steamer. Industry is concerned mainly with forests. In all probability the city maintains the world's leading concentration of sawmills. Logs arrive from such places as Igarka on the lower Enisei during summer, and for a little over half of the year lumber is exported to destinations around North Cape on ships sailing about hourly. Prewar Great Britain imported about half of its lumber from the Soviet Union, and other countries in northwestern Europe were rapidly becoming active customers. The railroad leading to Moscow is alive with trainloads of lumber needed within the Soviet Union. An extremely well-equipped school of wood technology and forestry assists Archangel in developing and exploiting the resources of the entire taiga.

Murmansk, near the western end of the Kola Peninsula, lies somewhat beyond the northern limits of the taiga, but has the advantage of an ice-free port, being open practically all days of each year. Most of its 120,000 or more people engage in commercial pursuits, woodworking, fish canning, and in metallurgical and chemical industries. Nearby sources of hydroelectric power and coal from Svalbard are used to treat ores of aluminum, iron, copper, and nickel. Phosphates are also mined in the vicinity. Coasts are heavily fortified and Murmansk ranks foremost among Soviet naval bases.

Between Murmansk and Leningrad is the Finno-Karelian Republic, where the predominant language is Ural-Altaic and the population is culturally similar to that of eastern and central Finland. Architecture is Finnish rather than Russian. Houses display an almost universal use of wood, which is elaborately carved or sawed along eaves and porches. The territory is 95 per cent forested and contains important mineral deposits to the north.

Leningrad is practically a taiga city. It is said that nothing short of the iron will of Peter the Great could have developed successfully a city in the practically uninhabited marshes near the bleak mouth of the Neva in the early eighteenth century. Not only is the climate cold and the

hinterland hostile to successful field agriculture, but the funnellike narrowing of the Gulf of Finland renders the site particularly vulnerable to flooding when winds blow from the west.

This march-site capital prospered as Russia's Baltic outlet, particularly after the loss of Estonia and the provinces to the south. Between 1703 and 1913 it grew to a population in excess of 2 million. Considerable industrialization accompanied this growth, in spite of the absence of coal, iron, and most other raw materials. Garments, textiles, furniture, and other products supplemented printing and kindred trades of a political center.

The Revolution in 1917 crippled Leningrad. Russia's eastward orientation, removal of the capital to Moscow, and similar blows were parts of a policy that assumed the border city to be indefensible in case of war, hence nothing should be done to develop it. Factories and resources were transferred to places farther east. Population declined to about one half million and much of the city fell into disrepair and decay.

As the Soviet Union grew more powerful, Leningrad again began to receive attention. Industries were established. Hydroelectric power, developed along the rivers Volkhov and Svir, was used for paper, cellulose, aluminum, and other industries. Shipyards were built as well as factories to turn out electrical goods, typewriters, textiles, furniture, railway equipment, and many other things. About three quarters of all Soviet ships, and all the icebreakers came from Leningrad ways. From its factories came half of the electrical goods, one third of the paper, and about one quarter of all machines and chemical products of the Soviet Union. Homes for workers were built at a rapid pace. By the outbreak of World War II the population was 3.1 million.

MIXED FOREST

Population density increases rather abruptly south of the taiga. Culture in the mixed-forest belt is more distinctively European, but landscapes are by no means those of Northwestern Europe. Rural habitations are typically log cabins, massively constructed to withstand the rigors of winter. Communications are poorly developed, although many railroads have been built, canals dug, and river navigability increased greatly. Soils are relatively infertile. Rye is everywhere the principal cereal crop north of the Volga, with oats increasing rapidly toward the head of the Gulf of Finland, where precipitation is quite heavy. Potatoes in-

crease in abundance southward, especially beyond Moscow. Very little wheat is grown to the north of the capital, but Soviet scientists are adapting new varieties to the inhospitable environment with considerable success. Flax is the chief fiber crop to the west; hemp, to the east.

The cities and clearings in the mixed forest support about one third of the population of the European part of the Soviet Union, but the rural density is only about fifteen per square mile, or roughly one third that in the United States.

The Belorussian Republic (White Russia) is a relatively backward part of the mixed-forest belt along the Polish border. The Pripet, or Polesian, marshes were settled by refugees during the period of Mongol occupation. Under conditions of isolation they grew somewhat fairer in complexion than the Great Russians and developed a somewhat different tongue, White Russian. Their wet and infertile lands raise such crops as rye, oats, sugar beets, turnips, and potatoes. The chief role of White Russia economically is to provide a surplus of meat, bristles, leather, paper, and lumber. The Industrial Age found it short of mineral wealth and sources of power. Its streams are too placid to turn turbines. Only three cities have attained populations in excess of 100,000. Minsk, the capital has been one of the slowest to increase in size during the Soviet period (Table 11).

Moscow, about midway between White, Black, Baltic and Caspian seas, on a minor tributary of the Volga, the Moskva, which drains to the Oka, is in the heart of the mixed forest. While rising as capital of the empire, the city developed along Asiatic lines, with broad streets flanked by low, white-walled buildings. Only Rome exceeded its number of churches, 1,600. Within its heart is the Kremlin, a walled city of palaces, churches, and gardens. In sharp contrast to its gaudy magnificence were the plain, dreary log cabins and small homes of the pre-Revolutionary population, or the vast expanses of drab, concrete apartment houses that now shelter the influx of modern workers.

The rise of Moscow as an industrial city was slow. Home industries gradually developed into factories for making textiles and leather goods. A comparatively important boom followed the freeing of the serfs. Machinery and other metallurgical industries were established on the basis of coal from Tula not far to the south. Commercially Moscow had an initial advantage of location near Valdai portages. Later it became the hub of the Russian railroad network. Practically every

important line, save that from Leningrad to Murmansk, now leads to Moscow. The new high-way system, only fairly begun by the outbreak of World War II, recognized Moscow as its most important node.

The initial effect of the Revolution was somewhat similar to that in Leningrad. From a pre-World War I population of about 1.8 million, general distress and the mad rush to the country about halved the city's size. The tide turned under Soviet auspices, with the policy of developing functions formerly held by Leningrad. A plan for city modernization resulted in widening a number of radiating boulevards, constructing high, modernistic buildings, expanding industry enormously, and even creating a magnificent subway system. Population rose well above four million, and may have become five. A huge park of culture and rest provides unusually fine recreational opportunities for the workers. Educational and research establishments of many kinds were built. Population increased so rapidly that in some years more than 3,000 new school buildings were erected. In 1939 Moscow was turning out about 15 per cent of the manufactured goods of the Soviet Union.

Nizhni Novgorod, now *Gorki*, the second most populous city of the mixed-forest belt, lies at the junction of the Oka and Volga. For many years Russia's largest fair was held there, attracting as many as 100,000 visitors and in some years doing the equivalent of over half a billion dollars' worth of business. Goods brought to the fair depended mainly on river transportation, so it was held in August. Gorki is now the center of a huge industrial district, sometimes called the "Detroit" of the Soviet Union. Its specialty is automobiles, but many river boats are built there and metal products of all kinds are manufactured.

About half of pre-Soviet Russia's manufacturing was concentrated in Leningrad, Moscow, Ivanovo, and Gorki, with Moscow foremost. Though there has been great decentralization in Soviet times, and in spite of the rapid strides made in the Urals and Ukraine, Moscow remains the center of the most active and diversified manufacturing district in the Soviet Union. This district has a radius of about 200 miles. Moscow itself contains about one quarter of all metalworking industries, turning out such products as airplanes, ball bearings, electrical equipment, railway engines, trucks, automobiles, and machinery. Within the district are Kolomna and Bryansk, to the southwest, making locomotives and machinery. Tula, Lipetsk, and other cities to the south are centers of heavy industry. Textile industries center northward. Moscow did almost all of Russia's

cotton weaving. With Ivanovo it still accounts for about 90 per cent of the output. Ivanovo was originally a linen town, as is Kulinin (Tver), both depending on local supplies of flax. The great strides of the Moscow, mixed-forest, industrial district result from the fact that in about 10 years, the Soviet Union underwent as much industrial revolution as England did in 150 years.

STEPPE BORDERLANDS

The change from mixed forest to grassland is broadly transitional. The unbroken forest ended about along a line from Chisinau near the Dniester, through Kiev, Orel, Kazan, and Izhevsk to Sverdlovsk. The rise of these cities and others depended on contrasts between products of territory on either side. The importance of this contrast was magnified when the true value of the soils to the south was discovered. The chernozem, black, fertile, lime-rich soils cover a belt about two hundred miles wide just south of the original forest. Rural population density rises as high as 250 per square mile in many districts and averages about 175 almost everywhere.

Annual precipitation of from 15 to 20 inches is sufficient for crops but insufficient to leach plant nutrients out of chernozem soils. Grass crops of many thousands of years, each of which produced a greater volume of roots than blades, enriched the soil and gave it its dark color. Farther south there is insufficient rain for most agricultural crops. Precipitation has been deficient for many millenniums. Less natural grass, and less humus is present, so soils are brownish rather than black. A line extending from Tiraspol on the Dniester, through Kirovo, Kremenchug, Saratov, and Orenburg to Magnitogorsk fairly well marks the southern limit of greatest agricultural productivity and typical chernozem soils. To the south agricultural undertakings are more-highly speculative. In northern Crimea (Krym) around the borders of the Sea of Azov and in a belt leading toward the northern Caspian southeast of Stalingrad, land is altogether too dry for cereal crops. Much of this territory is salt steppe, hostile to growth of useful vegetation, and toward the Caspian it is true desert.

Over half of the wheat, half of the barley, four fifths of the sugar beets, and two thirds of the home-grown tobacco of the Soviet Union are produced in the "black-earth belt," of the northern borderlands of the steppe.

Kiev, 0.846 million in 1939, early southern nucleus of Russian culture, center of early trade with Constantinople, and political capital of the Little Russian-speaking people, has long been par-

ticularly important as the great city in the heart of Russia's bread basket. While the great land rush to the steppe came late and was spectacular, some of the steppe borderland soils have been used for a greater length of time than soils in any other part of the Soviet Union. It was this region that fed the Varangian Novgorod-the-Great, and Muscovy.

Within recent years the steppe borderlands have become the heart of the collective farming movement of the Soviet Union. Here were Russia's most skillful agriculturalists. About two thirds of the Ukraine is intensively farmed, the best food-producing regions lying to the west. About half of the land is in wheat, but rye, barley, oats, millet, and sugar beets are grown in large quantities. Livestock density, especially cattle, is greater than in other parts of the Soviet Union.

The agricultural Slavs of Kievan Russia furnished the population surplus that built Muscovy. Racially they are still very much the same people as the Great Russian-speaking population to the north, but they are taller and somewhat less fair in complexion—differences that may have arisen as a result of occupational contrasts. The "Little" of Little Russian refers wholly to language and originated as a propaganda term, to convey the notion that the Ukrainian language was really only a variant of the Russian spoken in Muscovy. Ruthenian and Ukrainian are wholly synonymous terms, meaning Little Russian. The former has been used in a propagandistic way to refer to Ukrainians who long ago migrated into the Carpathians. It is used to convey the impression that there is some essential difference between them and other Ukrainians.

Rural landscapes in the Ukraine are more "European" than those in other parts of the Soviet Union. Farms are neat and attractive. Houses, typically with white walls surrounded by beds of flowers, are nicely kept. Villages are provided with football fields and larger ones have parks, libraries, parachute jumps, and other evidences of Soviet culture.

Kiev developed industrially as an agricultural center. Grassland heritage established it as the leader in leather industries, so that it contains many of the largest boot and shoe factories of the Soviet Union. Its sugar refineries produce about 70 per cent of the Ukrainian output. Other factories are concerned with making agricultural implements and machinery.

Many of the main towns and cities east and northeast of Kiev were established as ostrogs to resist Mongol and Tatar invasion. For this reason

they were commonly located on the west banks of streams. An outstanding exception was Samara, which as Kuibishev served as temporary capital of the Soviet Union during part of World War II. An east-bank location was deemed wise, though the depth of German penetration rendered the precaution unnecessary. The long-resident population of Volga Germans, who dwelt near Kuibishev, was transferred en masse to beyond the Urals.

The Chisinau-Kiev-Sverdlovsk line had greater significance in 1914 than it has today. Agriculture had made little progress beyond raising rye, potatoes, and flax in the mixed-forest belt. Industrial development made the mixed-forest region the greatest food-consuming part of the empire and food had to come from the steppe borderland. Within recent years new varieties of wheat and other plants have been adapted to colder regions. Moscow and Gorki are now far less dependent on the traditional granary of the Ukraine.

Odessa was long the main Ukrainian seaport and export center for wheat. It has the advantage of proximity to the mouths of the Dnieper, Bug, and Dniester. Its harbor is comparatively good and is one of the few along the northern shore of the Black Sea. In spite of slight population decline, Odessa still ranked as seventh city in the Soviet Union in 1939, and had made some progress industrially manufacturing agricultural implements, but as a seaport it fell behind Nikolaev (Vernolensk), largely because of inferior rail connections.

Though eight or more cities of over 100,000 along the steppe borderland owe their size to agricultural productiveness of the chernozem belt, the great population increases of recent years have occurred farther to the south in the drier grasslands.

THE STEPPE

The true steppe, south of the chernozem belt, is a short-grass grazing region. State farms and collectives venture to plant wheat, but not without risk. Soybeans and sunflowers have become important crops, the latter being an important source of vegetable oil. Barley is the most dependable cereal. In the more arid parts of the steppe the population density drops to three per square mile. The soils are by no means infertile; they are unproductive, mainly because of moisture deficiency. With irrigation they produce huge yields of wheat, rice, and cotton.

The real importance of the drier parts of the Ukraine is related to its coal deposits. Production

amounted to about 90 per cent of the output of the Russian Empire. Along the drainage basin of the Donets, a western tributary of the Don, are the Donbas coal fields covering an area of some 16,000 square miles. Every variety of coal is present, from hard anthracite through excellent grades of bituminous to inferior lignite. Krivoi Rog, 150 miles to the west, is an excellent source of iron. Other iron of the phosphatic variety lies nearby in the Kerch Peninsula of Crimea. For these reasons well over half of the pig iron produced in the Soviet Union comes from the southeastern Ukraine. This proportion will drop as time goes on, because only about one sixth of the Union's coal supply is thought to lie west of the Urals and Siberian sources will attract an increasingly large amount of future industrialization.

Kharkov, 0.833 million in 1939, fourth city in the Soviet Union, though somewhat removed from the heart of the Donbas fields, rose during the 1930's to become the industrial center of the Ukraine. Originally it was an agricultural market town with a site vastly inferior to that of Kiev, lying on the southern margin of the black-earth belt and lacking river transportation. It had some manufacturing before the Revolution but under Soviet control was given tremendous impetus, probably for the reason of location so far from the western border and inland, relatively safe from possible invasion. Factories were constructed, a modern city was planned and built—one of the most attractive in the Soviet Union. Electrochemical plants and other industries soon brought a huge increase in population and commercial significance. Though badly crippled during the German invasion, its broad streets soon began to witness rehabilitational activities after the German retreat and only a brief period will be necessary to see its activities restored to prewar levels.

Makeevka (Dmitrievsk) and *Stalin* (Yuzovskiy) are great foundry centers in the Donbas area. *Vorochilovgrad* (Lugansk) and *Kramatorskaya* are important machinery and heavy-industry centers. *Mariupol* and *Taganrog*, on the northeastern extension of the Sea of Azov, are import centers for Kerch ore and export centers for coal as return cargo. A great deal of Soviet coal goes to Mediterranean countries, all of which are deficient in their own supplies.

Between the iron of Krivoi Rog and coal of Donbas is the important Dneprostroy Dam across the Dnieper. Utilizing a fall of 100 feet in 40 miles, the half-mile-long and 180-foot-high dam at Zaporozhe is the basis of the second most important industrial concentration in the Ukraine. Dnepropetrovsk has become a city of over 0.5 million. Electric power is used to manufacture

coke from Donbas coal, chemicals of various kinds, aluminum, and steel from Krivoi Rog iron. Power is also wired to the Donbas basin in a sort of modernized version of the coal-to-Newcastle idea. Many small industrial towns have sprung up closer to the dam, Dnieprodzerzhinsk being the most important.

Rostov, 0.521 million, once a secondary trade center and seaport near the mouth of the Don, has risen rapidly both commercially and industrially. Within recent years it has been shipping more wheat than Odessa, acting as an outlet for Orenburg and western Siberia. It also manufactures vast amounts of railway equipment, machinery, and other items. Rostov is barely across the border from the Ukraine in the southern part of the Russian S.F.S.R.

The most rapid strides in cotton growing in new territory are now taking place in the Ukraine along the Black Sea coast and eastward in the southernmost strip of the Russian republic just north of the Caucasus. The Ukraine produces about 8 per cent of Soviet cotton and may increase the proportion materially because new varieties have been introduced that will grow as far as 47° N., which is higher in latitude than Duluth and equivalent to northern Maine, or central Montana. Rice is also a new crop for the Ukraine. It is sown from airplanes and harvested mechanically on some of the large state farms.

Greek and German colonists settled in many small but desirable parts of the southeastern Ukraine. Tatars still inhabit more desolate parts, such as the salt steppe in Crimea. Some of these have found their way into better land to the south of the Yaka Mountains.

RUSSIAN RIVIERA

The Black Sea coast of southeastern Crimea and a narrow strip along the western end of the Caucasus Mountains have climates very similar to those of Mediterranean lands and naturally support similar vegetation. The exotic eucalyptus now looms conspicuously in the landscape as it does in Mediterranean-climate California. These attractive coasts became a playground for the nobility in the days of Imperial Russia and the sites of beautiful homes when the serfs were liberated. The resemblance to the Mediterranean coast of France is close enough to justify the name Russian Riviera.

Sevastopol became Russia's leading naval base on the Black Sea. Beyond it strung an attractive row of settlements, including Krasnoarmeisk, now Yalta. Along the Caucasian coast were attractive settlements as far east as Poti in the Georgian republic. Large citrus groves have been developed toward the east, but the main use of these coasts at present is for health and recreation. Rest homes, some of which are old palaces and others of which are new and modern, for the Red Army and many other organizations—chiefly labor unions—now line the shores of the beautifully blue, Black Sea. Vacation periods are staggered so as to keep rest homes fully occupied at all seasons. The soviet ideal of providing all citizens except peasants and northern tribes a month per year in these homes was very close to an accomplished fact at the outbreak of World War II.

17: Russian Borders and Siberian Wedge

Climate is so arid between the Don and the Caspian that a great deal of territory is true desert. The rural inhabitants are such peoples as speak Kirghiz, Kalmuck, and Tatar tongues. Life is conducted along Dry World lines. Treaties with the Soviet Union insure grazing rights to people whose ancestors have so used the territory for many generations. Along the immediate border of the Caucasus Mountains, in agricultural territory, Great Russian is the prevailing language and life follows European World patterns. Farther back in the mountains people speak a tremendous number of languages of Asiatic origin, and they live in Asiatic ways as people of the Dry World. The variety in landscapes is tremendous.

Stalingrad in 1914 was an extreme outpost of Russian influence in the arid southeast with a population of 100,000. Location on the Volga where it approaches proximity to the Don gave the site importance as a commercial junction. Coal from the nearby Tsaritsin field proved valuable when the city became industrialized. The city specialized in tractors and other iron and steel products. Eventually some thirty miles of industrial establishments lined the Volga and the population reached 0.445 million. Not far away in any direction lay land with little or no agricultural value.

Astrakhan, the seaport near the mouth of the Volga, grew to 245,000 in a still more arid climate. An oasis strip along the Volga is its only agricultural hinterland, but the Caspian contains the greatest concentration of sturgeon in the Soviet Union and young sturgeon and sturgeon roe in the form of caviar are most highly prized foods among Russians. A curious fact, that fur-bearing seals live in the desert Caspian, is related to a connection between that sea and the Arctic Ocean during comparatively recent geologic times. Practically all other forms of Arctic life have disappeared from the Caspian because the salinity of its water varies from place to place and has increased recently on account of an excess of evaporational losses over inflow. Its level now stands about eighty-five feet below the Black Sea or Arctic Ocean and has been dropping during recent centuries.

Enormous reserves of petroleum are known to exist around the western and northern sides of the Caspian. The belt exploited first lies along the northern flank of the Caucasus, from Maikop in the west to Baku on the Caspian. Grozny, about midway, has been especially productive. New fields have been developed in Kalmuck and Kazak territories to the north. The great Emba field of the Kirghiz steppe is proving to be only one of many on the northern side of the Caspian. The Soviet Union is the only European nation with huge reserves of petroleum within its home territory. Amid the barren grazing lands of Dry World peoples, derricks and refineries now rise to alter skylines.

The useful lands far beyond the Caspian, where all Russian cotton was grown before 1930 and half is grown today, as well as Azerbaidzhan and Georgia, where 10 per cent of the cotton supply is produced, will be discussed in connection with the Dry World. In these territories Dry World cultures are still dominant among rural populations. The cities are European and industrialization is being accompanied by such rapid cultural evolution that probably it will not be many decades before these Dry World Soviet republics will be firmly incorporated in the Eastern Realm of the European culture world. The Slavic population of former Russian Turkestan—the vast area between the Caspian and the central Asian mountain knot—is probably as large as that of non-Slavs today and is growing much faster.

URALS

The highest peaks of the Urals rise to above 8,000 feet, but most of the divide between European and Asiatic watersheds is hardly one third that elevation. Several passes culminate under 2,000 feet and the important break between Molotov (Perm) and Sverdlovsk is only about half that high. Rivers flowing westward into the Volga and Pechora systems have such gentle gradients that they are navigable almost to their heads. The drop-off eastward toward the Siberian plain is steeper, but it is by no means precipitous. Slopes are long and grassy. Centuries ago, trappers

and traders found the routes now used by roads and railroads.

It has long been known that the Urals possess great mineral wealth. Peter the Great established state mines in them as early as 1699. Iron, copper, and coal are fairly abundant. Platinum and several extremely rare associated metals occur in such quantities that the Urals have long led the world's production. Although some lead exists, the Urals are deficient in two basic industrial metals, lead and zinc. The richest mineral districts lie between 58° and 51° N., between the region east of Molotov and the Ural Valley near Orsk in the extreme south.

The industrial cities between Molotov and Sverdlovsk (Ekaterinburg) lie along railroads and at places where coal is mined. Raw materials are supplied by copper smelters of Krasno-Uralsk and iron smelters of Nizhni Tagil.

Sverdlovsk is a great industrial center having a population of 0.426 million that carries on the manufacture of mining machinery, electrical goods, and many other things. It is the leading commercial center of the central Urals. Chelyabinsk, 0.273, not far to the south, is adequately supplied with coal for iron smelting and the manufacturing of heavy machinery, including tractors. Ufa, 0.246, on the west side of the mountains, is also thoroughly industrialized.

Magnitogorsk originated as an industrial center in 1931 for the utilization of huge deposits of magnetic iron ore, with purity resembling the famous ores of Sweden. By the start of World War II its population had increased to 170,000 and its output of pig iron was about half that of the British Isles. While the Germans were making preparation for their advance into western Russia and the Ukraine, it shared with other industrial centers of the Urals a tremendous spurt in activity and population. New factories were erected and others were removed from western locations to be reassembled beyond the possible limits of invasion.

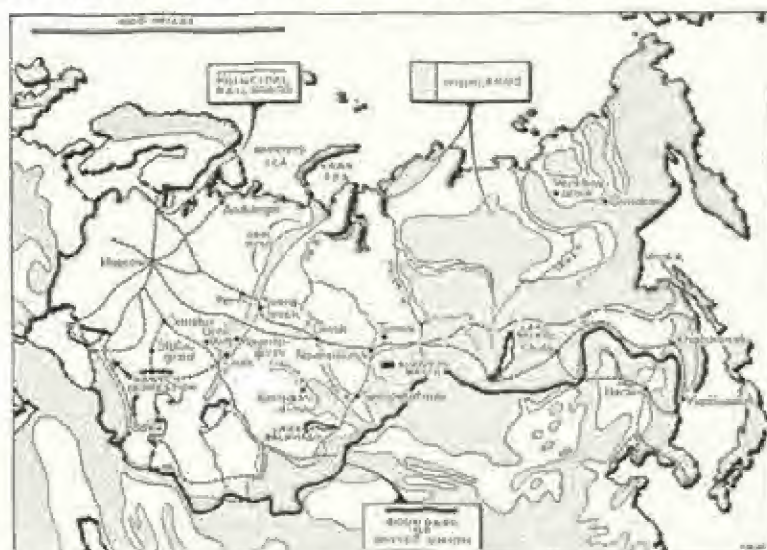
Along the Ural Valley, just

south of the main range, nickel and copper smelters of Orsk determined the location of another industrial center, which specializes in making diesel engines, chromium plating, highly finished machinery, and other metal products. Orenburg, downstream, has not only become industrialized but is also important commercially as a center of food production, especially wheat.

ASIATIC REPUBLICS

The trend of the Urals southward beyond the Ural River is continued in low, extremely arid hills that point directly toward Lake Aral. The huge Kazakh Soviet Socialist Republic extends over this arid region. It contains the important Emba and other petroleum districts toward the Caspian and minerals at various places, most important of which are the coal deposits of Karaganda Basin. These are thought to be the third largest in the Soviet Union. Karagandinsk, about three hundred miles north-northwest of Lake Balkhash, is a flourishing industrial city, with abundant supplies of iron as well as coal. Surplus coal is shipped to Magnitogorsk and other Ural furnaces.

Karagandinsk presents an excellent example of the kind of European World penetration into Dry World cultures that is taking place along the southeastern borders of the Soviet Union. The population density in the Kazakh S.S.R. just barely averages more than one-half person per square mile. Most of the area is desert or salt steppe. A grazing economy still covers most of the republic and culture is thoroughly adjusted to life in the Dry World. Coal and iron, however, have estab-



Eastern Soviet Union: Index map

lished something more than an outpost of Europeans. A thriving industrial district has arisen, with towns built wholly in European fashion. Towers and stacks rise high above the grazing lands; streets are lined with apartment buildings, and the dark of night is penetrated by shining electric lights. Native populations may first view such sights with amazement and curiosity, but gradually they overcome fear of them and ultimately adapt themselves to new ways of life. Native culture traits are generally given up and European traits accepted, until complete Europeanization is effected. Anxious and conscientious as Soviet authorities may be to preserve "nationalities" and existing culture traits, it is unlikely that they can stem the currents of change toward the Slavization and Europeanization of peoples with whom they come closely in contact.

To the south of Kazakh and toward the Caspian is the Turkmen S.S.R., four fifths of which lies in desert. At its northwestern corner is the strange Gulf of Kara-Bugaz connected by a narrow passage with the Caspian. So arid is the climate and so extreme the evaporation above the Gulf that a continuous current flows into it. Salt which thickly encrusts the bottom is precipitated from thoroughly saturated waters. Along the borders of Iran, where more precipitation occurs and streams bring waters for irrigation, great quantities of cotton, grain, and oil seeds are grown for export to the Russian republics to the west. Urban centers are becoming Europeanized in this territory, but the original population spreads widely and is part of the Dry World culturally.

The Uzbek S.S.R. lies to the southeast of the trans-Caspian depression and extends up into the high foothills and valleys leading to the Pamirs. Here are the finest cotton lands in the Soviet Union, much mineral wealth, and the source of karakul fur, black lambs. Highly developed and ancient Dry World cultures resist European inroads with considerable perseverance in this territory. Up mountain slopes lies the Tadjikistan S.S.R. on the borders of Afghanistan and Tibet, a stronghold of Asiatic nomadism rich in many valuable mineral deposits. To the north and somewhat lower is the Kirghiz S.S.R., where agricultural activities are far better developed.

SIBERIAN WEDGE, WESTERN PART

Penetration of Great Russians beyond the Urals was slow and intermittent until about the end of the sixteenth century when traders began a general plan of exploration, establishment of ostroms, and territorial possession. The Russian government

played little part in the movement. Cossacks were hired by the merchants to protect strategic sites and lines of communication.

The native inhabitants of Siberia and central Asia were peoples quite unlike the Slavs. Racially they were Mongoloids with round heads, straight black hair, brownish and yellowish skin, and "slant" eyes. They formed rather small, scattered tribal groups, highly diversified as to language and other culture traits. To the Slavs they seemed primitive, and culturally they were of another "world."

The cultural changes that have taken place in Siberia follow quite generally the pattern of the New World Revolution. Slavs displaced natives in proportion to the value of their lands in terms of European appraisal. At first the interests of the Europeans were primarily in furs; later they turned to minerals, timber, agriculture, and industrialization.

The earliest Russian exploitation of Siberian resources centered along the lower Ob, in the fourteenth century. The greater activities of the late sixteenth century extended rather broadly over the Ob-Irtysh drainage basin. Penetration eastward was directed mainly along the southern border of the taiga. The monotonous forest itself was a formidable barrier, as were the steppes to the south. A basis for claiming territory as far as the shores of the Pacific had been established by the early seventeenth century, even though the government failed to realize the importance of the venture. The air-line distance between Moscow and the Pacific is about 4,500 miles, or equivalent to the sailing distance from San Francisco to Yokohama and nearly that from New York to Rio de Janeiro.

Though the leading ostroms of western Siberia developed into rather significant towns at fairly early dates, Siberia long remained remote territory to which people might be deported for political reasons or for disobeying orders issued by superiors of any kind. Only during the closing years of the nineteenth century came railroad development to render accessible the products of Siberian agriculture. Russian colonization then gained impetus. Governmental appreciation of the value of Siberia arose during the middle of the century after Russia had made unsuccessful attempts to establish a safe maritime outlet by way of the Bosphorus and Dardanelles. The Pacific Coast offered another possibility to satisfy the Russian "urge to the sea."

The trans-Siberian railroad followed the southern border of the taiga, just as had the trails of traders for about three centuries. To the east of Lake Baikal its routes split, one keeping north of the Amur as far as Khabarovsk and from there

southward to Vladivostok, the second leading from Chita across the Great Khingan to Manchuria. Settlement along the railroad as far east as Lake Baikal was comparatively rapid. Important towns arose at nodal points where the east-west steel highway crossed the north-south lines of water transportation.

The modern development of Siberia prior to 1917 was mainly agricultural, with exploitation of mineral, timber, and fur resources having rather secondary position. Native populations had always been scanty and no difficulty was encountered in displacing them. Only 14 cities east of the Urals had attained populations in excess of 100,000 by 1897. The main impact of something equivalent to western Europe's Industrial and Agricultural revolutions came after the Revolution of 1917. By 1931 there were 36 Siberian cities of over 100,000 and in 1939 the list had swelled to 82.

Population increased from 10.0 to 25.6 million and land under cultivation from 32,000 to 98,000 square miles between 1914 and 1933, the later values being about 15 per cent of the population and 12 per cent of the cultivated land in the whole Soviet Union. Somewhat over three quarters of the present-day Siberian population is Russian.

Cossacks were dominant in the earlier Slavic settlement of Siberia. The Ukrainian element remained strong, outnumbering Great Russians until about the start of the twentieth century. With the development of the transportation system, Great Russians emigrated in large numbers, reducing the Ukrainians to a rather small minority. World War II witnessed a strong revival of Ukrainian immigrants, who were withdrawn in advance of German occupation forces and also the transfer of the entire "Volga-Deutsch" community to Siberian lands in 1941.

The geographical center of the Soviet Union lies close to Tomsk on a tributary of the Ob in longitude 85° E. The center of population has shifted from 36° E. in 1897 to 46° E., near Saratov, today. Between 1890 and 1940 the center of population in the United States shifted westward only 1° 33' 39". Differences in latitude account for relatively greater longitudinal displacement in Russia, but the movement was only about four times as far in miles, approximating 450 miles in the Soviet Union. This shift is mainly the result of the migration to Siberia.

Siberia is divided into its two most distinct parts by the Enisei River. To the west is lowland, remarkable for its flatness. To the east is a plateau of ancient rocks, beyond which there is a complex territory of mountains, basins, and plains.

The most important part of the Siberian Wedge is in western Siberia centered on the parallel of

55° N. along the trans-Siberian railroad. When parallel and supplemental lines were built to the south the zone widened, but it is quite restricted by short growing seasons on one side and severe aridity on the other as far as agriculture and rural population density are concerned.

Spring wheat, oats, rye, and barley are the principal cereal crops. Flour milling started at a fairly early date as the first industrial development. Cattle for meat, and butter were available for export as soon as communications permitted. Kurgan, Petropavlovsk, Novosibirsk, and Barnaul have become important meat packing centers, as has Semipalatinsk across the border in Kazakh. Siberian butter supplied not only many needs of the European Russians but was exported in rather large quantities to Great Britain and other countries before the start of World War II.

The zone in which agriculture may be considered worth while is not much over 500 miles wide at a maximum and narrows toward Lake Baikal. Curiously, this severe limitation is related to Ice Age aridity. Nearly three quarters of Siberia is underlain by permanently frozen ground. This would not be true if the Ice Age precipitation had been sufficiently heavy to produce a cover of continental ice, such as existed in northern Europe in similar latitudes. But Siberia lay far from the moist Atlantic air-masses and rarely received heavy snowfall, then as now. No cover of ice protected it from radiating heat into space, so that the earth froze deeply. Summer thaws could not keep pace. Eventually, toward the northeast, ground was frozen to depths of even more than a thousand feet. Elsewhere the depth of freeze is generally measurable in terms of hundreds of feet. With the advent of milder temperatures of Recent geological time, thaw has a slight upper hand, but it will be many centuries before appreciable depths are reached. Tundra and taiga spread widely above the frozen ground, and field agriculture makes little progress into such areas. Without field agriculture, European World penetration can hardly be more than spotty.

The flatness of the lowland of western Siberia is the result of deposition of sediment in a vast Ice Age lake. To the south the basin was enclosed by the uplands where many tributaries of the Ob, Irtysh, and Ishim now rise. To the west it encroached on the lower flanks of the Urals and to the east against the highlands east of the Enisei. Ice blocked waters from flowing into the Arctic Ocean. Overflow occurred toward the south. A similar large lake once existed in North America between the height of land separating Mississippi Valley

and Arctic drainages on one side, and an ice barrier in Canada on the other. This Lake Agassiz also received sediments from inflowing streams and their flat surfaces have become some of the finest wheat lands in North Dakota and adjacent parts of Canada, just as the sedimentary flats formed in the old Siberian lake now account for much of the agricultural productivity of the western lowland of Siberia.

Even today the Arctic mouths of Siberian rivers freeze so solidly during the long cold season that they impound the flow of waters coming from warmer regions to the south. Extensive flooding occurs behind the annual ice barriers forming vast swamps that extend through the western Siberian taiga. In summer the dams melt and waters pour out into the Arctic.

During the Ice Age the Arctic ice barrier thickened to such height that waters in the old Siberian lake rose until they found an outlet leading to the Caspian. That landlocked sea rose and expanded in area until its surplus waters found a channel to the Black Sea. This channel is clearly defined on the surface today, though it has been unused for many thousands of years. It runs fairly parallel to the Caucasus on their northern side along the Manych depression. With disappearance of the Arctic ice barrier in summers, the Siberian lake drained, its southward overflow was abandoned as was the Manych River, and the Caspian has dropped to about eighty-five feet below sea level. Old villages that once served as seaports now stand inland well above its waters.

Long, severe winters, with the period of freeze extending from mid-October to mid-April, coupled with inadequate transportation made the European population of Siberia extremely self-sufficient. This Slavic culture trait is nowhere else so strongly developed. Home industries reduced the need for industrial and commercial enterprises so severely that landscapes were affected. Siberian towns were always curiously deficient in stores, even by standards of eastern Europe.

The rapid rise of the industrial regions in the Urals and urbanization to the east upset many Siberian patterns of occupancy and development. The planned economy of the government and, especially, the terrific influx of people during World War II brought revolutionary changes. Novosibirsk is now a city of 278,000 in an industrial conurbation said to contain over 0.4 million. Omsk, 0.281 million; Krasnoyarsk, 0.190; Barnaul, 0.148; Tomsk, 0.141; Semipalatinsk, 0.110; and Petropavlovsk, 0.092 are now important cities.

The Kuznets Basin on the Tom, a branch of

the Ob southeast of the western Siberian plain, now produces about one third of the coal in the Soviet Union. It also supplies large amounts of lead, zinc, silver, gold, copper, manganese, and some tin. Kuznets coal is not only important locally but is sent in large amounts to the industrial centers in the Urals, where coal is neither abundant nor of very good quality. Cars that carry coal westward return with iron ore, meeting about two thirds of the industrial needs of the Kuznets industrial region. The rest of the iron is mined locally. Stalinsk, Prokopyevsk, Leninsk-Kuznetski, Kemerovo, and other nearby centers have a combined population of about 0.5 million.

Kuznets steel production is favored by manganese deposits in the Gornaya Shoria Mountains to the south. Diversified industrialization is rendered possible by the great mineral wealth within short distance. Much lead and zinc is supplied by Ridarskoe, once an important source of metals to peoples of a prehistoric Bronze Age culture.

To help meet food supply problems, collective farms around the Kuznets district now raise wheat, potatoes, and sunflowers, as well as cattle, on lands not long ago ranged over by nomads of the Dry World, who lived in movable, fur-covered, tentlike yurts.

Less than 10 per cent of the area of Soviet Asia is actually being used by Europeans. In addition to the Dry World areas to the south is the area to the north of the Siberian Wedge where Europeans can only establish outposts. About two thirds of Siberia is covered by taiga or tundra.

Almost all tundra routes and lines of habitations are oriented in north-south strips along rivers. The direction of natural gravitation is northward with the flow of currents in the warm season, but the coast is inhospitable and until very recently of little commercial significance. Now logging operations penetrate the forest and rafting takes logs northward. The greatest centers of operations are in the Ob and Enisei lowlands. Igarka, the gathering and shipping point for Enisei logging activities, lies about on the Arctic Circle. In less than ten years its population increased fivefold to 15,000 in 1939. Ships leaving it and other Arctic ports head west across Kara Sea, through the magnificent strait between the North and South Islands of Novaya Zemlya, across Barents Sea, and into the White Sea to Archangel. River-boat navigation connects tundra and taiga settlements with the east-west railroad facilities of the Siberian Wedge.

SIBERIAN WEDGE, EASTERN PART

Lake Baikal is the eastern extremity of western Siberia. It is interesting physically because of

great depth, in excess of 5,700 feet—the deepest lake in the world. Though eighth in area it contains more water than any other lake. Its overflow is from near its western end, along the Angara River, past Irkutsk, and eventually into the Enisei. The steep Baikal Mountains flank its northwestern side and westward present a steep front toward western Siberia.

Most of the territory north and northeast of Lake Baikal is sparsely inhabited by Mongoloid Tunguses. Farther north on either side of the Lena are the Yakuts. To the extreme northeast, toward Bering Strait, are the Chukchi, and toward Kamchatka, the Koryaks. These peoples belong culturally to the Polar World. Population density is extremely low everywhere, increasing somewhat along the southern borders of the tundra where grazing conditions are best for reindeer. A few Russian outposts were established along the rivers of northeastern Siberia about a century ago and many more have been founded under Soviet auspices. Verkhoyansk, on the Yana, one degree north of the Arctic Circle was long regarded as the earth's "cold pole." More recently, Oimekon, on the upper Indigirka in 63° 15' N., has been recording temperatures that are consistently lower during the coldest months. It will take many observations in northeastern Siberia to establish the dubious honor of record cold, but certainly no other place in the habitable parts of the world approaches Siberian records. The records from Antarctica are too sketchy to merit serious consideration at present, but there is some possibility that the cold pole may lie there.

Of the ten longest rivers in the world, six are in Asia, four in Siberia, and two in northeastern Siberia as shown in Table 12.

Table 12 The ten longest rivers

	length, miles		length, miles
Nile	4,000	Amur, NE Siberia	2,900
Mississippi-Missouri	3,988	Congo	2,900
Antazon	3,900	Lena, NE Siberia	2,860
Ob, W. Siberia	3,200	Enisei, W. Siberia	2,800
Yangtze	3,100	Hwang-Ho	2,700

Russian explorers in the late seventeenth century avoided the taiga as much as possible and therefore stayed generally south of the Lena Basin. The Amur Valley brought them out of necessary taiga penetration east of Lake Baikal into mixed forest toward the Pacific. Before reaching the more attractive country, they began meeting a new type of Mongoloid in distant outposts of China. It was at Nerchinsk, not far east of Chita, that China signed its first treaty with a European nation.

Here in 1689 the boundaries of the two empires were defined. Russia was to lie on the Lena side of the Yablonovi Ridge and China claimed the Amur side.

In spite of the seventeenth century agreement, Russians penetrated down the Amur and gradually into northern Manchuria without any very notable displays of Chinese interference. The relations between the two powers have generally remained cordial and citizens of one have been quite free to settle in lands of the other. The main line of Russian advance led down the Amur to the Pacific coast north of Korea. When the railroad was built one branch followed that route. In 1903 the Russians completed a shorter line, the Chinese Eastern Railway, branching off at Chita and crossing Manchuria to Vladivostok with connecting lines leading to the Yellow Sea. Defeat in war with Japan, in 1904–1905, excluded Russian control from southern Manchuria but not from Harbin and the northern part of that country. The Manchurian route to Vladivostok remained in Russian hands until 1931 when the Japanese took it over. It is firmly in Soviet hands today.

The latest railroad into eastern Siberia departs from the original line at Krasnoyarsk on the Enisei. It winds around the northern side of Lake Baikal, through Kirensk north of the lake on the upper Lena, Bodaibo on the Vitim, Komsomoisk on the lower Amur, and thence to a new seaport, Sovetskaya Gavan. This port lies on the Tatar Strait, across from Sakhalin, slightly south of 50° N. The new railroad will result in considerable development of northeastern Siberia. Exploitation of such natural resources as timber, minerals, and animal life will proceed promptly. Some valley areas will prove suitable for European settlement. This extension of the European World will involve little displacement of native cultures because much of the new route lies in practically uninhabited taiga.

The Pacific maritime part of Siberia is an outlying fragment of the European World tied to the main Siberian Wedge by the trans-Siberian railroads in a rather loose way. The valleys are excellently suited to European colonization. Such crops as wheat, rye, oats, barley, sugar beets grow along the lower Amur Valley and along the great Ussuri Valley, toward the coast. Coal exists in considerable quantity not only in the more settled areas but also at many places farther north.

Khabarovsk, near the junction of the Amur and Ussuri, is the commercial and political center of the Far Eastern Autonomous Soviet Socialist Republic, a division of the Russian federated state.

It is one of the cities showing rapid growth in Table 11, having attained a population of nearly 200,000 by 1939. Birobidjan, a short distance to the west, is a new experimental settlement for Jewish colonists. Komsomolsk, a short distance down the Amur, is a rapidly growing steel-producing center. Founded in 1932, it grew to 71,000 by 1939. Vladivostok, 200,000, has coal nearby, so that it is an important industrial city as well as ice-free port, contact with open sea being maintained by icebreakers when necessary. The new port of Sovetskaya Gavan may reduce its commercial significance somewhat, but more threatening is a trade agreement with China that restores to the Soviet Union free access to Yellow Sea ports.

A vigorous campaign has recently been under

way to establish outposts of the European World in Kamchatka. Though Petropavlovsk-Kamchatski was founded in 1741 on one of the finest harbors in eastern Asia, it remained nothing more than a small fishing center until the middle of the nineteenth century when whaling brought considerable prosperity. Since then it has retained considerable export business: Salmon, herring, and cod abound in nearby waters. There is no problem in catching them, but the region is one of the foggiest on earth and there is considerable difficulty in drying fish for export. Canning factories have been established, and crab meat has become an export item of considerable value. The recent acquisition of the southern half of Sakhalin Island and the Kuril Islands from Japan, as a result of World War II, gives the Soviet Union complete control of the Sea of Okhotsk, and, for the first time, free access to its entire Pacific coast.

18: Shatter Belt: Finland and the Baltic States

Extending as a transitional zone between the Northwestern and Eastern culture realms of the European World is the Shatter Belt, an area of political instability where contrasting cultures have met, clashed, and fragmented. To the south it reaches to the borders of the Mediterranean Realm. In terms of recent nationalities it extends from Finland to northern Greece. To the west it is flanked by the Gulf of Bothnia, Germany, the western borders of the old Austro-Hungarian Empire, and the Adriatic.

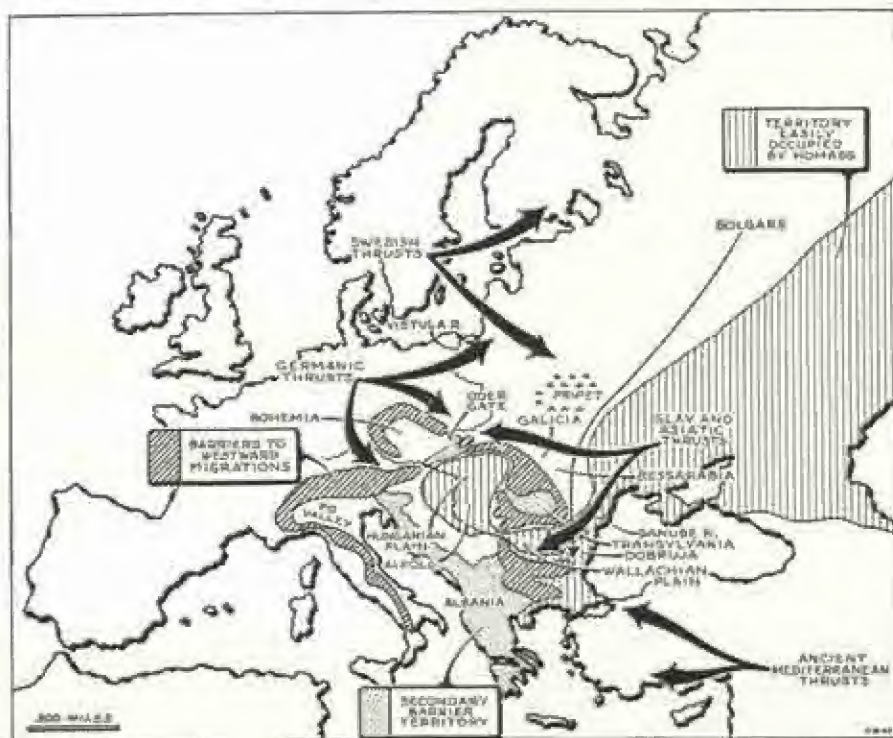
PHYSICAL BACKGROUND

The zone of transition between more distinctly continental and maritime varieties of climate tends to emphasize cultural contrasts on either side but is rather vulnerable to penetration. Either Russian or German finds it possible to live in Poland without materially changing his ways of life.

With rather few exceptions the main movements

of peoples and cultures have been westward in Europe. Swedes, Germans, and Greeks have made important thrusts in the opposite direction at times, but the traditional entry of new peoples has been across the plains to the north of the Black Sea, or in extremely ancient times, by routes south of the Black Sea across Anatolia. Forests and marshes farther north were barriers to migration of most non-Ural-Altaic-speaking people. Routes through the better grasslands of the Ukraine kept to the south of the Pripet (Pinsk) Marshes and therefore led to the convex front of the Carpathians. Here was the first topographic barrier to free movement.

Those who chose to go north and west along the Carpathians encountered forest, but there were many passes leading across the mountains to lands more to their liking. Dukla and other gaps led to the grasslands of Hungary, or the upper Vistula could be followed to the Oder Gate to the Morava (March), where it was possible to



Shafter Belt: major cultural thrusts

turn westward into Bohemia or follow the Moravian Corridor to the Danube. Those who turned south of the Carpathians might reach the broad Wallachian Plain of the lower Danube, which opens eastward like a funnel. At the constricted end of the funnel is a formidable barrier, Kazan Gorge, where the Danube is confined to a channel 80 yards wide and cliffs rise to as much as 2,000 feet. To the south attractive valleys invited invaders into the Balkan Mountains and other highlands. Rosul and other passes lead north from Wallachia across the Transylvania Alps, to Transylvania, Hungary, and other attractive lands.

The routes followed by one group of invaders were likely to be followed by others. The lands attractive to one were generally desired by another. There were but few large lowlands or wide basins available for settlement. Less aggressive groups retreated to smaller valleys, or up their sides to highlands when more powerful peoples arrived.

A few of the eastern invaders spread into the forests of the north, where they encountered Balts and Nordics. Some of the Nordics ventured southward or eastward to encounter various peoples beyond the forests.

CULTURE BACKGROUND

Mediterraneans of an extremely ancient stock followed migration routes south of the Black Sea into Europe at some date prior to 2500 B.C., bringing Indo-European languages. In southeastern Europe they encountered Alpine peoples with whom they blended to form the Dinaric stock, which now occupies a belt extending from Albania to the Po Valley, and northward into Hungary. Dinarics, Alpines, and traces of Mediterraneans are the basic racial strains in the southern part of the Shatter Belt.

In the central part of the Shatter Belt the basic strain is Alpine, but many Nordic elements have penetrated it from the west and considerable Baltic stock is present. Still farther north, Nordic stock is blended with both Alpines and Mongoloids. The Alpines brought eastern tongues of the Indo-European language, while the Mongoloids brought Ural-Altaic languages.

When Trajan conquered the territory along the lower Danube in A.D. 98, he found Thracians present who probably were strongly Mediterranean in stock. These are among the oldest Shatter Belt inhabitants known rather definitely, and they are ancestral to the Rumanians. Toward the west were Illyrians who were more Dinaric and who are represented today by the Albanians.

During the third and fourth centuries, Asiatic invaders, known as Huns and Avars, appeared from the Ukrainian steppe and penetrated into the Hungarian Basin. Some returned eastward. Those who remained were few in number and their stock was soon diluted with Alpine and Dinaric blood. Many of their culture traits remained. Nordic Goths appeared in the eastern Shatter Belt and other Nordics at various places from time to time during the days of Roman decline.

Slavs started appearing in numbers during the sixth century and their immigration continued freely until the tenth century. There is considerable question as to where they originated, but the weight of opinion indicates the territory west of Kiev as the culture hearth from whence most groups dispersed. They entered the Shatter Belt around both ends and through the Carpathians. Those who went into Galicia and Poland in part migrated into Hungary and from there to Slovakia and Bohemia. These became the North, or West Slavs. Those who went through Wallachia migrated westward into valleys and highlands extending to the margin of the Po Valley. Dominant among these South Slavs were the Serbs, who arrived during the sixth century.

Along with the Slavs came Bulgars from beyond the Volga, an Asiatic people who originally spoke some Finno-Ugric tongue of Ural-Altaic origin, and who were Mongoloids. For a while they remained in Bessarabia but they crossed the Danube in the seventh century, moved into Dobruja (Dobrogea), ascended the Balkan Mountains, and spread into Macedonia. As Bulgarians they gave up their Finno-Ugric language in the seventh century and became more and more Slavized as time went on. Adopting agriculture, they gave up many of their old nomadic culture traits but still prefer a diet of cheese curds and meat, wear untanned leather boots, sheepskin coats, and exhibit the reticence, patience, and energy of nomads. Within recent times many of their names have changed from the common ending *-ov* of Bulgarian to the Serbian *-vitch*.

In the ninth century another group of Mongoloid, Ural-Altaic-speaking people appeared, the Magyars. They had crossed southern Russia rather slowly and, unlike the Bulgars, retained their language and culture after reaching the grasslands of the Alföld (the plain). Though their Mongoloid strain has been so diluted that most living Hungarians are Alpines and Dinarics, they clung to their language with tenacity and retained many nomadic culture traits in their Danubian surroundings. Magyars readily absorbed the Avars of the Hungarian Plain but expelled the Slavs. It took

some four centuries before any considerable number of Magyars would turn to farming, in spite of the fact that few parts of Europe were more attractive agriculturally. It was not for ten centuries, however, that wheat displaced livestock in attaining first rank in Hungarian economy. This happened in the early nineteenth century. The Magyars stood as a firm barrier between North and South Slavs in occupying the central part of the Shatter Belt.

After the arrival of the Magyars the main racial and linguistic patterns of the Shatter Belt had been determined. By the end of the ninth century, four main groups of peoples had differentiated into the dominant subdivisions that exist today: (1) the northern, non-Slavic Lapps, Finns, Esths, Letts, and Lithuanians; (2) the North Slavs, the Poles, Czechs, Slovaks, and Ukrainians; (3) the non-Slavic Magyars, who stood as a wedge between the main Slavic elements; and (4) the South Slavs, the Slovenes, Croats, Serbs with closely allied, mainly Slavic, Rumanians and Bulgars, and the non-Slavic Albanians and Greeks along the southern fringes of the Balkan Peninsula.

Though the period of great migrations had closed by the tenth century, the Shatter Belt was yet to witness invasions by other peoples. Mongols made a rapid foray and conquest in the early thirteenth century leading to temporary possession of the central Danubian basins, a movement checked in 1241 with the death of Ogdai Khan. More important were the results of beats of the "Teutonic hammer against the Slavic anvil" to the north. The *Drang nach Osten* drove back the western boundary of the medieval Shatter Belt across the German plain into Poland and the Baltic States, mainly between the thirteenth and sixteenth centuries. Swedes reached Finland in the twelfth century and by the sixteenth were moving into the Baltic States at a time when Germany was weak and Russian activities were directed southward. With the rise of Russia in the eighteenth and nineteenth centuries, the Swedes retired. To the south, Saxons and Thuringians poured into Bohemia in large numbers in the thirteenth century. The Slavic Czechs were glad to welcome them because they brought new skills in mining and metallurgy.

Turks were the last important invaders of the southern Shatter Belt. Between the fifteenth and eighteenth centuries they overran it almost completely reaching the outskirts of Vienna in 1683, when their gains began turning into the long decline that characterized Turkey as the "sick man of Europe." Montenegro escaped the Turkish invasion because it was rough territory defended by excellent fighters.

When the Turks arrived, Vlachs (Wallachians, Rumanians) were living north of the Danube in Moldavia, Wallachia, and Transylvania; slavized Bulgars were living south of the Danube as far as the Rhodope Mountains; Serbs, who had become a mixture of Slavic and Illyrian peoples, were dominant in territory between the western end of the Balkan Mountains and the Adriatic; Albanians and Greeks, with Hellenic elements greatly diluted by Slavic, occupied the territories they hold today.

Italians have long been interested in the eastern coast of the Adriatic. For centuries this was a stronghold of Illyrian pirates. Slavs later displaced them but followed the same profession. Venetians found it necessary to police the Dalmatian coast as early as 827, to capture it in 998, and to fight against Dalmatian piracy until the end of the eighteenth century. Captive pirates were taken to Venice and sold as slaves.

The penetration of Jews into the Shatter Belt started in the Middle Ages, when they arrived



Shatter Belt peoples

serfs or small peasants. In Finland, Estonia, Latvia, and Czechoslovakia, cooperative societies assisted the movement and made it successful. Production was increased. Poland and Hungary resisted the movement. Their governments fell into the hands of aristocrats who were no more interested than the Hapsburgs in raising the living standard of the poor. In all other Shatter Belt countries the result of reform was to decrease production. Land in the hands of inexperienced owners produced less than it had under the landlord system. Too many turned to raising livestock and dairy farming at once, with the result that insufficient grain was produced. Small political units found it impossible to balance their economy. European and American aid staved off many disasters, but when the western world fell into the depression of the 1930's these props no longer existed and suffering became acute.

The result of World War II has been to place the Shatter Belt rather securely in Soviet hands. Bessarabia, Carpatho-Ukraine, and a good share of Poland—all lands that were predominantly Russian anyway—have been incorporated directly. The Baltic States have become Soviet republics. The rest of the belt has been organized into a zone of friendly nations, a "security fringe" along the western boundary of the Union.

FINLAND

Extending roughly from 60° to 70° N., Finland (Suomen Tasavalta) is "the nation farthest north." About one third of its 134,588 square miles lies north of the Arctic Circle. It is the only country with a highway leading from its main road network to the Arctic Ocean, a project completed in 1932.

The 1952 population was 4.0 million, a density of about 28 per square mile.

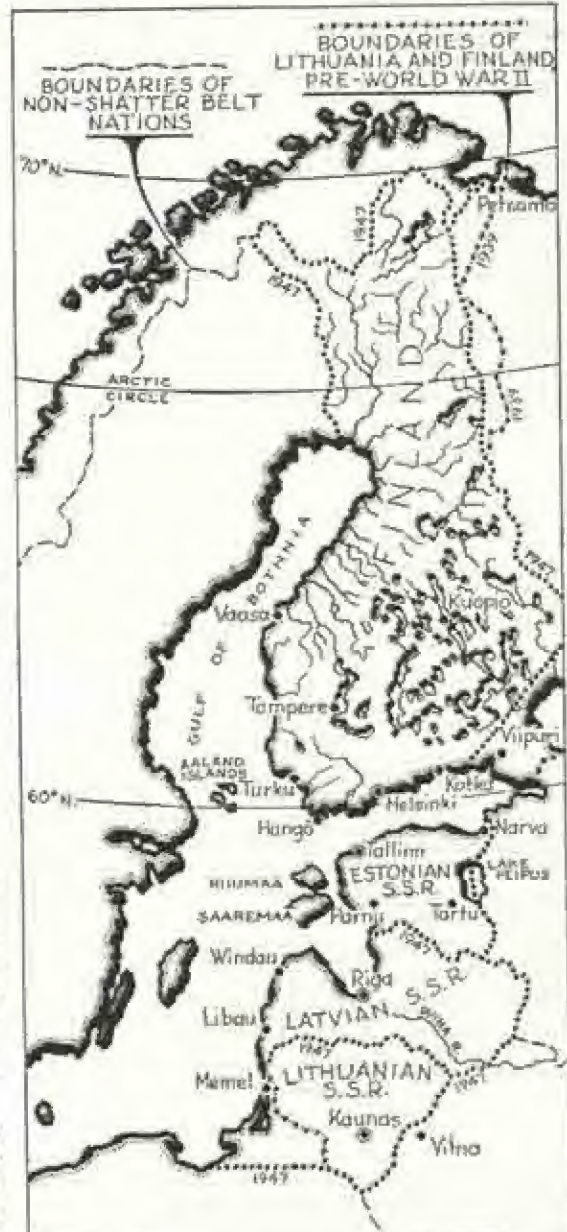
PHYSICAL BACKGROUND

Finland is composed of extremely old rocks similar to those in all but southernmost Scandinavia. They were formed prior to the appearance of vegetation on land and therefore contain no coal. In the extreme north are deposits of nickel, gold, and iron. To the southeast is some iron and copper, and to the southwest lead, copper, and zinc. Aside from nickel, these metal resources are not particularly valuable.

Most of the surface is flat. The interior is a low plateau, but parts of it are undulating and a maximum elevation of slightly more than 2,000 feet occurs toward the Norwegian border. A coastal plain extends along the west (Bothnian) and south (Gulf of Finland) coasts. The descent

from plateau to coastal plain is rather abrupt, and sharp breaks in stream gradients create rapids that have either been harnessed or are potentially available as sources of electric energy.

Lying close to the center of the Fennoscandian icecap, the country was intensely glaciated. The plateau has been irregularly scoured and the coastal flats are broadly covered by moraines, some of which form long belts of high ground.



Finland and the Baltic States: index map

Soils are thin. Those of the plateau were scraped away by ice and the moraines have not yet had time to develop deep, mature soils. Some 60,000 lakes fill depressions of various sorts. These cover about one eighth of the entire country, and are particularly concentrated in the central and southern parts of the plateau. Many have long axes pointing somewhat east of south along the direction of major ice movement and scour. Precipitation is heavy enough to require a rather dense runoff pattern. Hardly any part of central and southern Finland is more than ten miles from a lake or stream capable of rafting logs.

Winters are severely cold. Monthly temperatures above 20° F. from December to February occur only toward the southwest. At the head of the Gulf of Bothnia, cold spells commonly see the thermometer register -45°, and lower. Snow cover persists for 100 days in most parts of the country. Potatoes are planted in June and harvested in August.

Practically all of Finland lies in the taiga, some 60 per cent being forested. Forest is densest between the southern coast and the latitude of the head of the Gulf of Bothnia. No other European country has either as high a percentage of forest cover, or as much timber per capita. North of the Arctic Circle pine, spruce, and birch are restricted to more favorable localities and finally give way to tundra at the extreme north. About one third of Finland is tundra, bog, moor, or heath. These less useful types of surface also occur southward in higher parts of the plateau.

CULTURE BACKGROUND

Possibly some 5,000 years ago, Paleolithic peoples appeared in northern Finland. They came from the east and brought a primitive Ural-Altaic tongue. Racially they were distinctly Mongoloid. Their descendants are the Lapps of northern Norway, Sweden, Finland, and the Kola Peninsula. Some 2,000 of these live in northern Finland today, but they are decreasing in number, primarily for the reason that Finnic women generally refuse to marry Lapps, and Lapp women tend to marry less Mongoloid types of men.

There were probably several migrations of Mongoloids across Finland. The original Finnic stock is supposed to have differentiated in northwestern Russia. Though a Finno-Ugric (Ural-Altaic) tongue has been retained, the people have become less and less Mongoloid and more and more Nordic, so that the Finns today are predominantly Nordic, especially toward the west.

The earliest inhabitants of southwestern Finland may have been Nordics who were very similar to the Swedes; in any event many immigrants of Swedish stock appeared at an early date and settled the coast from Vasa south, and eastward along the shores of the Gulf of Finland. Finns gradually reached these lands and a considerable racial mixing followed, with the result that the Nordic strain is particularly dominant along the coasts.

The present-day differentiation of the inhabitants is made mainly on a linguistic basis. The population is considered to be about 89 per cent Finnish, 10 per cent Swedish, and less than 1 per cent Lappish. The Swedes generally farm; the Finns live in the forested parts of the country and prefer to engage in forest industries, but many farm; and the Lapps live to the north of the forests. There are about as many Germans as Lapps in Finland, and the Russian population is somewhat larger than the two combined.

Finnic and Lappish tribes long lived in little groups with no central government—in the fashion of the Polar World. Swedes began a number of "crusades" in the twelfth and thirteenth centuries, which introduced Christianity, law, order, and security in Finland. The eastern boundary of Finland follows rather closely one established by Swedes and Russians in 1323.

Sweden officially was in possession of Finland from the sixteenth to the nineteenth centuries. Though new forms of government, schools, and Lutheranism were introduced, Swedes did little about penetrating the central plateau where most of the Finns lived.

Between 1809 and 1917 Finland was in Russian hands as an autonomous grand duchy with most liberties guaranteed. It proclaimed independence at the time of the Russian Revolution and became a republic in 1919. The boundary settlements of 1920 were generous to Finland, giving it considerable land in the extreme north where a harbor, Petsamo, could be developed, and a fair slice of Karelia, a territory culturally resembling Finland closely but with Greek Catholic instead of Lutheran affiliations. The League of Nations gave Finland the Åland Islands in 1921 with a population of about 20,000 Swedes.

For security purposes, the Soviet Union demanded Hogland (Suursaari), Hangö, and part of the Karelian Isthmus in 1939. Leningrad lies within fifteen miles of the old Finnish border, and the Russians have not forgotten that Finnish independence was obtained through German help in 1918. Finland declined to grant the concessions, and a war followed with the result that the Soviet Union added not only the points it needed for

fortification but a strip of Finnish Karelia and the important city of Viipuri (Viborg). These were temporarily regained by the Finns in 1941. In 1945 the population of the Aaland Islands served notice that it no longer desired affiliation with Finland. The Soviet Union acquired, under the treaty of 1947, territory around Viipuri, a considerable area northward along the eastern border, and the Arctic coast of Petsamo.

LANDSCAPES

As three quarters of the dry land is forested, and 85 per cent of the value of all exports originates in the woods, most of Finland has the appearance of a pioneer country. Lumber is the almost universal building material. Piles of cordwood line railroad tracks for use in locomotives. Logging operations supply sawmills in clearings. Industry is concerned mainly with making lumber, plywood, boxes, barrels, furniture, boats, matches, pulp, and paper.

More people, however, are engaged in agriculture than in forest industries. These are concentrated along the coasts. Only 5 per cent of the country is in crops and another 5 per cent in pasture, but one half the population is rural in the sense of living outside of towns or cities with populations in excess of 10,000. Hay, potatoes, rye, turnips, onions, cauliflower are important crops; sugar beets are grown in the south; and some wheat in the extreme southwest. Barley is planted beyond the Arctic Circle to be cut as hay because it will not ripen. A surplus of dairy products is available for export. Hay occupies somewhat better than half of the cultivated land and potatoes more than one fifth.

Finnish agriculture was stimulated tremendously by the introduction of cooperative societies shortly after 1900. Some 7,000 were in existence in 1939 with a membership of about one quarter of the entire population. These handle one quarter of all retail and 40 per cent of wholesale trade. Not only do they serve as distributors of low-cost products to farmers, but they maintain stores, hotels, and other institutions, even in the hearts of the larger cities.

URBANIZATION

Most Finns live near water bodies. Population is densest on islands, shores of lakes, along rivers, and on the coastal plain. About half of the population is resident in seven cities with over 10,000 inhabitants. Fewer than 10 per cent live in the largest city. Only one of the larger places, Tampere, lies inland from the coastal plain.

Helsinki (Helsingfors), 0.376 million, the capital and cultural center of Finland, is also its greatest industrial center with factories engaged in printing, food processing, metal working, and making machinery. It is a clean, "white" city, amply provided with parks and attractive rural surroundings.

Viipuri, 73,000, the main old Finnish trading station toward the head of the Gulf of Finland, now in Soviet hands, is the site of a Swedish castle erected in 1403. This is one of the few really old buildings north of the Baltic. Wood was used so universally that most medieval landmarks have long since been lost to fire. The interests of Viipuri are commercial. About one-quarter of all Finnish exports left its outports, mainly because of a canal to the Saima lake chain and water bodies extending well into the central plateau, and hence into the heart of the forest.

Turku (Åbo), 104,000, in southwestern Finland, at the terminus of a ferry route from Stockholm, is the third great port. It is industrialized with factories making machinery and processing foods. Turku has long been a stronghold of Swedish cultural influences and education.

Tampere, 103,000, the "Manchester" of Finland, established its first textile mill in the early nineteenth century. With abundant hydroelectric power it is a center for cloth, leather, and wood-working industries. *Kuopio*, 25,000, still farther inland and at the head of the Saima lakes, engages in forest industries, match manufacturing, and grinding flour.

Petsamo, the ice-free port on the Arctic, has been lost to the Soviet Union. At the opposite extremity, is *Hangö*, the only ice-free port on the south coast. *Kotka*, about midway between Helsinki to Viipuri, is an outlet for sawmills on Pajänne Lake and the Kymi River. *Porkkala-Udd* is leased to the Soviet Union for defense purposes.

BALTIC STATES

Estonia, Latvia, and Lithuania are now Soviet republics with a combined area of 66,7 thousand square miles and population of 5.9 million. Latvia, 25,402, had the largest area, but Lithuania, 2.9 million, the largest population. Estonia had the smallest population of any European country except such tiny anomalies as Andorra, Luxembourg, and San Marino. Though the Baltic States were organized and defined on substantial racial and cultural criteria, they became political entities only after World War I.

Physically the Baltic States are comparatively

flat, though some sections of eastern Lithuania attain the elevation of 1,000 feet. Irregular glacial moraines have interrupted drainage creating many lakes, bogs, and swamps. Streams wind sluggishly and most of them have little value either as sources of power or waterways. Coal is absent. Northern Estonia, however, contains rich deposits of oil shale which are strip mined for fractional distillation into gasoline and similar products. It also has some phosphatic rock useful for making fertilizer, and limestone, for cementmaking. Peat, which is abundant in poorly drained places, and wood are the chief fuels. Forests are relatively widespread but not so widely as in Finland. Soils are generally thin and of low quality, as in the mixed-forest belt of adjacent Russia. The Baltic States are not particularly attractive lands nor has nature endowed them with many resources.

ESTONIA

The Esths are a Finnic people who departed from the main stock somewhere in northwestern Russia and migrated to the flat, wet lowlands between the Gulf of Riga, Lake Peipus (Peipsi, Chudskoe), and the Gulf of Finland. Though resembling the Finns rather closely, they have assimilated Baltic and Alpine strains to a considerable degree. Their two languages, Estonian and Livonian, are extremely close to Finnish. Danes converted the Esths to Christianity in 1219, and they became Lutherans after the Reformation. Under Russian rule, which lasted until 1917, an attempt was made to enforce membership in the Orthodox Church, with a result that about 19 per cent were converted to Greek Catholicism. Some 78 per cent of the country is Lutheran at present.

Out of a population of 1,134 million, about 88 per cent is Esth and 9 per cent Russian. The latter live compactly in the eastern part of the republic and have had very little influence politically. Some 18,000 Germans formed the first and most influential minority group. These withdrew in 1939. A Swedish minority of about 1 per cent of the total population is concentrated in the west, mainly on the islands of Hiiumaa (Dago) and Saaremaa (Oesel, Etzel). An extremely small Jewish minority, together with a few Finns, Letts, and Poles, completes the list of population groups.

Though the Esths are a rather compact and linguistically distinctive group, no precedent had ever existed for recognizing them nationally. They were practically enslaved by German traders in the twelfth century. During the thirteenth to sixteenth centuries Teutonic Knights confiscated

their lands and built huge castles from which a subject but resentful people were held down. Hansards built their commercial ports of Reval (now Tallinn, *Taanilinn*, meaning Danish city), and Pernau (Pärnu). Swedish rule followed the breaking of Hanse power lasting from 1561 to 1721. It was liberal and many advances were made by the Esths, but Germans and Balts retained most of the land. The famous University of Dorpat (Tartu) was founded in 1640. The rule of Imperial Russia, after the Treaty of Nystadt in 1721, was attended by considerable commercial progress. Estonian ports were developed as outlets for Russian goods. As late as 1860, however, most of the land remained in German and Balt hands and most Esths were serfs.

When Estonia declared its independence in 1918, almost all of its inhabitants were peasants. An agrarian revolution occurred in 1919 when 96 per cent of all privately held land passed into peasant hands. A few large properties were converted into collective farms. The agricultural products are about the same as those of Finland, with flax as an important addition useful not only as fiber for linen but as a source of linseed oil and oil cake for livestock. No great agricultural prosperity, however, could arise in a country so poorly endowed. One seventh of the land area is waste, being either too wet or boulder strewn for agriculture. Nor were the forest reserves particularly large—20 per cent of the small country. When the Soviet Union isolated itself economically, the reason for the existence of Estonian ports vanished and the new nation practically collapsed economically.

Finnic peoples are endowed with a stubborn determination that is not readily overcome. In spite of the hardships and seemingly hopeless handicaps that faced the Estonian nation, a great deal of progress was made during its short life. Two thirds of the land was put to work growing such crops as hostile climate and poor soil would permit. The forests became sources of lumber, plywood, and pulp. Oil shale, limestone, and phosphate rock resources were developed, and peat was dug for fuel. Anchovies were caught offshore. Local textile needs were met, and sugar was made from homegrown beets. Free trade was established with Latvia. Education was fostered, so that 80 per cent of the population became literate. University enrollment established a world record; in 1928 one out of each 220 persons in the entire country was enrolled as a student.

No great urbanization was possible but Estonian towns became industrialized. Tallinn, founded in 1219 and long a Hanse port with picturesque medieval buildings, serves as the best

port and engages in sawing lumber, ship building, and heavy industry. Under Soviet auspices it should develop a great deal because it is ice free for as many as four months longer than ports toward the head of the Gulf of Finland. The outpost, *Baltiski*, is open all winter. *Narva* benefits from the fact that Lake Peipus is 100 feet higher than the sea. This drop is utilized to furnish practically all of the electric power generated in the country. Cotton is imported and with local flax furnishes the raw material for Narva's textile mills. *Tartu*, another interesting center, with its university, is an interior commercial town with forest and agricultural industries.

As a result of diligence and planning, Estonia managed to produce a small surplus for export, consisting of timber, pulp, paper, raw flax, butter, eggs, potatoes, alcohol, cement, and even a bit of cotton cloth.

LATVIA

Letts and Lithuanians are primarily Balts. The Letts are a compact people whose ancestral home is along the lower part of the Daugava (Dvina). On a linguistic basis they appear to have become differentiated from the Lithuanians as early as the twelfth century. Lettish and Lithuanian, however, are closely related Baltic tongues of the eastern group of Indo-European languages. No important groups of Letts live outside the boundaries of Latvia.

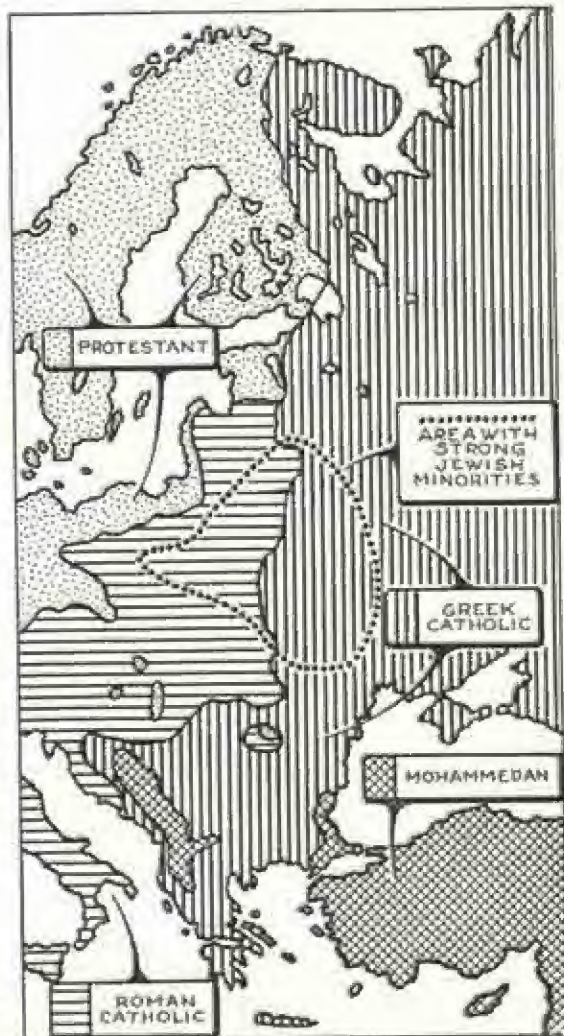
Racially and linguistically the Letts have little in common with their northern neighbors, but they became Christians in the twelfth century and adopted Lutheranism after the Reformation. About 60 per cent of the population is still Lutheran, about 20 per cent Roman Catholic—these being a rather compact group in the southeastern province of Latgale—and about 20 per cent is affiliated with the Eastern Orthodox Church.

Like Estonia, there is no precedent for the Latvian nation. The Letts went through about the same experience with foreign overlords with an additional complication of being under Polish rule.

The population of 1.95 million consists of about 75 per cent Letts, 12 per cent Russians, with Jews and Poles as strong minorities. A German minority has been transferred back to Germany in spite of the deep roots it had established during long residence. Nearly 75 per cent of the population is rural, about 18 per cent industrial, and about 6 per cent commercial.

Riga, 0.393 million, like Copenhagen, thoroughly dominates its country. With about one fifth of the population of Latvia, the economic well-being of the city determines that of the nation. Founded by Hanse merchants in 1201, it

became the world's leading lumber market. Under Swedish rule, 1621–1710, it prospered as Russia's natural gateway to the west and generally maintained leadership over other east Baltic ports. Small boats and barges come down the Daugava. Even within recent years half of them have started from Russia. In centuries past the flow of commerce was mainly the other way—toward Valda portages. With severance from its natural hinterland in 1917, Riga was plunged into extreme depression. Between 1927 and 1932 it prospered as a result of a commercial treaty with the Soviet Union. Relationships between Latvia and the Russians became less friendly after 1932, and Riga again suffered. As went the economic welfare of Riga, so went that of Latvia. With the es-



Shatter Belt religions

establishment of the Latvian S.S.R., both city and nation should prosper.

Riga is now kept open in winter by icebreakers. The supplemental ports of Windau (Ventspils) and Libau (Liepāja) on the open coast are practically ice free.

Latvia is about half under cultivation and one quarter in forest. Its own commerce consists mainly of exporting butter, meat, eggs, and flax, and importing cotton, coal, and iron for its small industrial establishments; however, its imports are in quantities wholly insufficient to maintain its ports.

LITHUANIA

Lithuanians have a strong nationalism and a proud past. Their Neolithic ancestors were practicing agriculture at least as early as 3000 B.C. By 1000 B.C. they had domesticated animals, and were weaving woolen and linen cloth. Their Baltic tongue is closest to Sanscrit among European languages, and they have held it firmly. Their coast furnished amber to the ancients of the eastern Mediterranean. With the aid of marsh and forest they resisted the Teutonic Knights more successfully than did their neighbors on either side. Their main glory dates to the days of Greater Lithuania, when territorial control extended to the Black Sea.

After 1691, when Lithuania and Poland came under the same monarch, the star of Poland began to outshine that of the Baltic state. A century later, in 1772-1795, both were parceled among Russia, Prussia, and Austria. Lithuania went to the Slavs, but its main port, Memel (Klaipėda), was retained by the Prussians.

Lithuanians constitute about 80 per cent of the population, the main minority groups being Poles, Russians, Jews, and Germans. From Poland the Lithuanians received their Roman Catholic religion, and from Germany a feudal land-tenure system. About 80 per cent of the people retain the Roman Catholic religion, Protestant minorities occurring in the west and Greek Catholics in the east.

In becoming a nation in 1918, Lithuania (Lietuva), faced many handicaps. Too many Germans and Poles were included within its boundaries. These became uneasy minorities. The main commercial significance of the country had been as an outlet for Russian goods, a trade that collapsed during the chaos following 1917.

Memel, the leading Lithuanian port, remained a thoroughly German city from its founding until the outbreak of World War II. Its com-

merce depended on logs rafted from Poland and goods from Russia. It was strongly Protestant. So foreign was it to rural Lithuania that the city and a surrounding territory of 1,100 square miles were placed under international supervision in 1919. Lithuanians promptly seized it, unlawfully, but the League of Nations, instead of objecting, sustained the act.

Vilna, the historic capital of the fourteenth and fifteenth centuries, had in fact become a Polish city surrounded by a population that was about half Lithuanian at the end of World War I. It was given to Lithuania, but it was captured by the Poles in 1920. Again the League proved impotent to stand behind its first decision. Many regard this as the first great blunder of the League of Nations, an indication that smaller states could not depend on the international organization for practical assistance. In 1939, the Soviet government assigned Vilna to the Lithuanians.

Plagued by the Memel and Vilna questions from the start, the political history of Lithuania has been unhappy. Because of meager natural resources, as indicated by the fact that rye is the leading crop, agricultural prosperity was attained only through great difficulty. Old German and Balt estates had to be divided among peasants. Only 45 per cent of the country proved suitable for crops. Forests occupied only about 19 per cent. Little industrialization was possible because practically all basic materials were wanting.

Nearly 77 per cent of the population of 2.9 million is engaged in agriculture. Wheat, barley, oats, potatoes, and flax follow rye as crops. Flax is the money crop, mainly exported in raw state or in the form of linseed oil. Dairying is developed to a high degree and livestock raising important. The main agricultural exports before World War II were flax, meat, butter, eggs, hogs, and horses. Forest products ranked second to agriculture. Industry was confined almost wholly to agricultural and forest products. Peat and wood had to serve as the chief fuels.

Kaunas (Kovno), 100,000, the capital, rose as a modern commercial and political center. Memel, 38,000, was transformed into a modern port. As a railroad terminus from Russia, it will undoubtedly prosper as the chief port of the Lithuanian S.S.R. Though the cities are small, the break between the sizes of their populations and those of the many little market towns that are scattered throughout rural regions is sharp. The greatest break of all, however, has been cultural. The rural population was Lithuanian and had peasant interests. A wide gulf separated them from the urban populations, which were German and Jewish, with commercial interests.

19: North Slavic States

Balts occupied not only Lithuania but also an extensive territory to the west and south in prehistoric times. An ancient commerce to the Valdai portages and the Dnieper was in their hands. At some undetermined date, more or less coincident with the rise of the ancient Greeks, Alpine peoples began invading Balt lands. The Alpines came from the east and moved along the northern flank of the Carpathians. Many went north along the Bug and the Vistula into what is now Poland. With them came Slavic tongues, differing considerably from Baltic, though both are Indo-European languages. The Slavic-speaking people came in bands and scattered into nucleated, agricultural settlements. By the start of the Christian Era, Polish Slavs were clearly differentiated in the Vistula Basin and had spread westward into Pomerania on the Baltic, and along the valley of the Oder.

POLAND

Poland of medieval and modern times has had only one distinct topographic boundary, a portion of the crest of the Carpathians. Its real heart has centered in the Vistula Basin, but it has spread east, west, and north to indefinite frontiers. To the east Poles recall and claim much credit for Greater Lithuanian expansion; but Polish language is not dominant anywhere east of a line extending roughly from Bialystok, through Brest-Litovsk (Brzez and Bugiem), to Przemyśl. Poles, however, owned extensive tracts of land in White Russia (Belorussian S.S.R.)

and retained about 60,000 square miles of territory on the wrong (east) side of the "Curzon Line" after World War I. This constituted about 40 per cent of the modern nation. No topographic break helps to delimit the distribution of Poles anywhere to the east or southeast because all stream divides between Baltic and Black sea drainages are low and irregular. To the west, the population was predominantly Polish as far as the Oder until the sixteenth century. Even as late as 1790 there were more Poles than Germans in Breslau. Pomerania was predominantly Polish until late in the eighteenth century. German pressure forced Poles eastward out of their traditional land holdings, or it absorbed them. To the north, Poles encroached upon Balt lands, establishing a very indefinite culture boundary with East Prussia and Lithuania.

Poland was first constituted as a kingdom in 966. Its zenith of political strength was reached during the fourteenth to seventeenth centuries. After union with Lithuania Poland became part of one of the most important states in Europe with far greater unity than existed in either Germanic territory to the west or Slavic lands to



Poland: index map

the east. Later came a decline, culminating with the "partitions" of 1772, 1793, and 1795 when the country was divided completely among Prussia, Austria, and Russia. Years of resentment and frustration followed, but national aspirations were realized with the establishment of Rzeczpospolita Polska, the republic, after World War I.

The creation of the new state was at the expense of Russia to the extent of 101.2 thousand square miles; Austria, 30.9; and Germany, 7.0. Soon 11.1 thousand square miles were seized from Lithuania, an act confirmed by the League of Nations in 1923 three years after seizure. In 1938, 419 square miles were seized from Czechoslovakia. Such large minority groups were included in the seized territories that the population of the entire country became only about two-thirds Polish. About one fifth was Russian. Posen (Poznan) was about one third German.

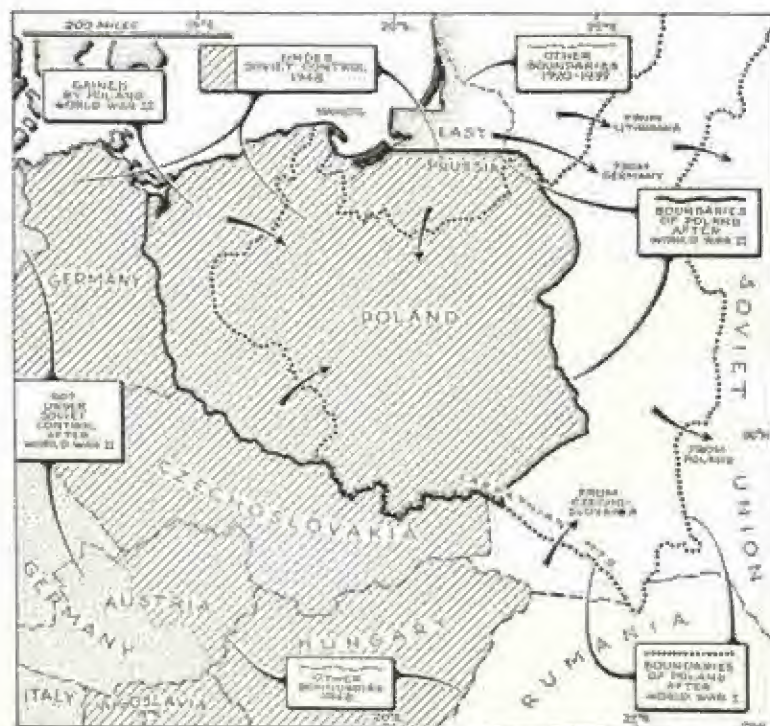
Possibly the worst error of the Treaty of Versailles was the creation of a "Polish Corridor," a strip of land leading to the Baltic, to provide the new country with an outlet to the sea. Poles actually outnumbered Germans in a ratio of roughly 3:1 in this strip, but it meant the severance of East Prussia, which was thoroughly Germanized, from the remainder of Germany, providing one of the major causes of World War II.

Most of the Poles were newcomers to the Corridor, resident only since about 1900. It is doubtful whether a plebiscite would have shown a preference for Polish nationality. The Masurians, a group of Poles in southeastern East Prussia, voted in favor of German nationality. Switzerland and Czechoslovakia prospered as inland states, as a Poland of reduced size, concentrated in the Vistula Basin, might well have done among friendly neighbors. The Polish republic, however, made few moves calculated to win friends or inspire confidence. Treated generously at Versailles, backed by the promises of France and the general fear of the Soviet Union held by states west of the Shatter Belt, and inspired by seventeenth century traditions, Poland embarked on a program of aggression rather than one of establishing internal unity and prosperity.

About 40 per cent of Poland was in the hands of a very small number of families in 1920. Industries were almost wholly in the hands of Germans and Jews. These had been established during Russian days, when the Russians who were unable to manage factories themselves were glad to assist those who could. Instead of experiencing an agrarian revolution, such as occurred in most Shatter Belt states, a few estate owners gained political control. These had little concern about bringing land into higher productivity or about raising the living standards of the great masses

of rural Poles. Little attempt was made to train technicians, a movement that was making considerable progress in the Soviet Union.

The Poles are generally regarded as solidly Roman Catholic, but the last census indicated that fewer than two thirds of the nation adhered to that faith. About 22 per cent belonged to various branches of the Eastern Church, 10 per cent were Jews, 2.5 per cent Protestants, and about 0.5 per cent indicated preferences for various other religions. Prior to 1850 about half of the world's Jews



Recent boundaries of Poland

lived in Poland. In 1940 the ratio dropped to 20 per cent. A great migration of Jews occurred during the nineteenth century, mainly to Germany at first and, after 1850, to the United States. Polish cities were about one third Jewish, whereas those to the west ordinarily ran about 6 to 7 per cent, and those along the western fringe of the Soviet Union rarely exceeded 15 to 17 per cent. Out of a population of 34.8 million in 1940, over 3 million were Jews. After the great pogroms during German occupation it is impossible to estimate accurately the total number of Jews remaining in Poland.

Densest rural population lies west of a line extending roughly from Tarnopol, east of Lwów (Lemberg), through Warsaw (Warszawa) to Danzig. Extensive areas have as many as 375 inhabitants per square mile, whereas to the east few local regions have more than 50.

The physical divisions of Poland are similar to those of eastern Germany. Northern coastal plain lands are generally poor and infertile. Morainal hills extend across the Vistula into East Prussia, where there is a great deal of bog and wet territory, as well as many lakes. To the south is a central depression, where moraines alternate with lower flats. Extensive marshes lie between Warsaw and Berlin. The Bug, Vistula, and other streams tend to flow westward, as do the north German rivers, where they are deflected by moraines. This northern part of Poland resembles Lithuania and northeastern Germany. Oats and rye cover moraines; sugar beets are grown toward the west; flax and cattle are other important products. Few towns north of Warsaw have attained more than rural village status.

The excellent agricultural lands of Saxony and Silesia broaden into the Carpathian Piedmont of Poland. On these are concentrated wheat, barley, potatoes, and other important crops. Population density is high. Rural population is more literate and progressive than to the north. Considerable industrialization occurs toward the mountains for reasons similar to those in Saxony.

The Carpathian belt is about half forested. Peaks rise to heights of 5,000 feet and more, but a great deal of territory is below 2,000 feet and many passes are low enough to be utilized by railroads. Oats, clover, and root crops are raised in valleys. Pasturage is widespread and dairying important, as is the raising of sheep and meat cattle.

The population of Poland is about two thirds agricultural. Industry is favored by a wealth of natural resources, but the Poles have not been too successful in developing them. About 23 per cent of Poland lies within the mixed forest. Logs

were long rafted down the Niemen and other rivers, where German manufacturers might turn them into lumber and other useful products. Coal, iron, lignite, petroleum, natural gas, zinc, salt, and potash salts are abundant. Poland, prior to World War II, ranked first among European nations in the production of zinc, and fourth in coal output. It also had a surplus of petroleum, which went mainly to Germany, an oil-poor country. Nearly all of the mineral wealth lies along the Carpathian front—coal, zinc, iron, and salt to the west, and petroleum and potash salts to the east.

Two main industrial developments suggest a contrast similar to that between Leeds and Sheffield. Warsaw, Lodz, and Posen (Poznan) retain textile manufacturing interests from the days of Russian development. Important also are various agricultural industries. In contrast is the industrial development of the extreme southwest. Krakow, Teschen (Tessin), and Upper Silesian centers, the latter containing six cities of 50,000 or more split by Versailles among three nations, are mineral and heavy industry centers. Carpathian slopes with adequate water power, petroleum, and Upper Silesian coal favor manufacturing. In addition to metal products, there is a considerable output of cement, brick, tile, and glass.

Warsaw Urbanization is most concentrated in Warsaw, 0.688 million, in the heart of the agricultural plain of the Vistula Basin. Naturally a crossroads between Vistula traffic and the historic dry-land route from Germany to Valdai portages or Moscow, this city became the hub of the rail net of the late nineteenth century. It was also favored by being capital of the republic. Its industries include cotton, wool, flax, jute spinning and weaving establishments, distilleries, breweries, flour mills, leather-goods factories and timber mills. Some making of machinery developed later.

Lodz, 0.532, also ranks high among textile centers in Slavic lands. Posen, 0.258, has similar industries. Lwów (Lemberg), 0.318, is a Polish outpost, surrounded by Ukrainian people. During the Middle Ages it was an important warehouse and commercial center on one of the main highways from the Baltic to the Black Sea. To Hanse merchants it was an inland stronghold. During recent years it has prospered from nearby mineral resources.

Krakow, 0.259, served as capital between the eleventh and fourteenth centuries. It was the center from which Roman Catholicism, received from Vienna, was spread among the Poles. Its strategic location, as a crossroads between routes from Silesia to the Ukraine and Black Sea, and

from Bohemia and Danubian basins to the Baltic, is less important today than fuel and mineral resources, which have converted Krakow into a center of heavy industry.

Danzig (Gdansk), an ancient amber market on the Samland coast, developed as a product of Hanse activity. Its inhabitants were thoroughly German. In 1920 Danzig, with 754 square miles of surrounding territory, was declared a free city in order to provide a Baltic outlet for Poland. Hostility between the Poles and the city became so great that the former built the entirely new port of Gdynia a few miles away, which so prospered that in 1938 it handled 9.2 million tons of cargo to Danzig's 7.1 million. Neither Pole nor German was satisfied with the political status of Danzig. The first military move of World War II, was its reoccupation by German troops in September, 1939.

As an outcome of World War II, Poland lost much of its non-Polish eastern territory to the Belorussian and Ukrainian Soviet republics. It gained much of East Prussia, Upper Silesia, Pomerania, and the city of Danzig. Germans have been sent back to Germany to a degree as yet undeterminable. As a nation under the guidance of the Soviet Union, Poland now has about the same area—roughly 150,000 square miles—as had been created at Versailles, but its meridional boundaries have been shifted westward and, in 1952, its population was 25.0 million.

CZECHOSLOVAKIA

Little historic precedent existed for the creation of Czechoslovakia (*Ceskoslovenska Republika*) at the end of World War I. A Moravian Empire had existed in the ninth century, but it fell to the Magyars in the tenth. A Kingdom of Bohemia, during the Middle Ages, fell into Austrian Hapsburg hands. Czechs were long under Austrian rule, and Slovaks under Hungarian. Though speaking tongues so closely related that one has little trouble understanding the other, Czech and Slovak are far apart in many culture traits.

Czechoslovakia lies wholly inland and has a curious shape, being only from 50 to 200 miles wide and 600 long. Though its boundaries are crossed by 65 railroads, no direct communication existed between the heart of Bohemia and the more remote parts of Slovakia when the country was created. Topographically it consisted mainly of a distinct basin, the Bohemian "diamond," to which a long, kitelike tail of mountains was appended. Czechoslovakia was created

politically at the insistence of Woodrow Wilson, who still occupies high rank among the Czechs as a national hero. In spite of many diversities, it was one of the most successful political creations of Versailles. It has abundant resources and maintains a nicely balanced economy.

Slavic-speaking peoples began invading Bohemia and the mountains to its east early in the Christian Era. By the sixth century Czech and Slovak became differentiated from Polish as kindred, West or North Slavic languages. Nordics had long infiltrated and mixed with Alpines in Bohemia, but the Czechs dominated the territory and indicated their preference for Slavic culture traits by sending to Constantinople for teachers in the ninth century. Saxons and Thuringians appeared in large numbers in the thirteenth century in western Bohemia. They gradually spread into highlands on all sides of the basin. The Germans were as jealous of their culture traits as the Czechs, so the two groups remained quite distinct. Bohemia, with rather pure Czech population centrally, was surrounded nearly everywhere by a population more than half German.

Slovaks originally spread southward into the northern plain of Hungary, but after the Magyars arrived they retired to the mountains to remain relatively pure culturally, though primitive in the eyes of the Czechs.

Ukrainians appeared rather late over Jablonicka and other passes above Galicia and Bucovina, to settle in the Carpathians east of the Slovaks.

Of the population at the start of World War II—about 15 million—roughly half were Czechs; 3.3 million Germans outnumbered 2 million Slovaks. Other minorities included 0.8 Magyars, 0.5 Ukrainians, 0.2 Jews, 0.1 Poles and a scattering of other peoples. The first five groups were distributed in fairly compact units; Czechs were surrounded by Germans, with Slovaks to the east, beyond whom were the Ukrainians, and south of whom were the Magyars. There had been comparatively little friction between Czechs and Germans. The Germans had occupied the Bohemian rim for so many generations that they had lost track of most family ties in Germany, and in fact were regarded by the people of Germany with about the same feeling of contempt that they held toward Austrians. The "Sudeten Question" raised by the Nazi propagandists was almost sheer fabrication. The friction between Czech and Slovak was somewhat more evident. Czechs so greatly outnumbered Slovaks that they ran the country. They had made Prague (*Prag, Praha*) the capital, instead of historic Brno, which would have been more central. The Czechs were urbane and had a long record of revolt against the Church, among

other things asserting independence from the authority of the Pope. The Slovaks were backward, rural, and devoutly Roman Catholic. The still more primitive Ukrainians retained the creed of the Eastern Church.

While Czechoslovakia is extremely diversified topographically, it is divisible into four main parts: Bohemia, Moravia, Slovakia, and the Hungarian Plain.

Bohemia and its rim of uplands drains almost entirely through the Elbe (Saxon) Gate; and hence into the North Sea. It is endowed with a considerable mineral wealth, contains coal, vast forests, extensive lowlands that are 90 per cent agricultural, with a climate sufficiently mild for raising apples and plums, and it is the most densely populated part of Czechoslovakia.

Moravia is a lowland to the southeast of Bohemia which narrows northward as the Moravian Corridor to the Moravian Gate, an easy pass between the Sudetes and Carpathians to Upper Silesia. Moravia is primarily agricultural, but as the boundaries of Czechoslovakia were drawn, it crossed into industrial Upper Silesia to the headwaters of the Oder and Vistula. Early metal industries of Moravia depended on the local forests. Later they turned to Silesian coal and to iron from Hungary, Sweden, and Spain.

Slovakia extends northward from Hungary through many hill and mountain ranges to the scenic, glaciated High Tatra. It is largely rough territory given over to forest and grazing, with agricultural lands used for barley, flax, and vineyards. To the east is Ruthenia, roughly half in forest, one quarter in meadow and grazing land, and only one quarter under cultivation. Lumber and the products of grazing are supplemented by the mining of rock salt. Even the home industries are backward.

The Czechoslovakian part of the Hungarian Plain is a narrow strip along its northern border, which extends westward into Lower Moravia and resembles it in being agricultural—leading crops including barley, wheat, grapes, sugar beets, maize, and various deciduous fruits. The many streams of the plain head in Slovakia.

Agriculture, animal industry, and forestry support less than half of the population of Czechoslovakia. The agrarian revolution of 1924 confiscated estates of the former Austrian nobility and placed the best lands in the hands of peasants, who have been extremely successful in working them. Wheat, rye, barley, oats, potatoes, sugar beets, maize, hops, and flax are principal crops. In 1938 there were surpluses of grain and sugar for export. Bohemia and Moravia produced an overwhelming proportion of the total.

Industrialization was favored by the presence of iron, copper, cobalt, nickel, sand, and other minerals. For its start the coal supplies seemed adequate, but they were soon found to be insufficient. Much industry was developed by Bohemian Germans, although the Czechs attained thorough competence and were gaining rapidly before the outbreak of World War II. The little corner of Czechoslovakia that extended into Upper Silesia contained Teschen with the finest coking coal of the district as well as supplies of iron. Among the industrial exports of prewar Czechoslovakia were woolens, cottons, beer, shoes, pencils, glass, porcelain wares, iron and steel products, and timber.

Czechoslovakia has long enjoyed a good income from tourists. Such spas as Carlsbad (Karlovy Vary) maintain some of the largest and finest hotels in the world. Toward the Elbe Gate is the "Bohemian-Saxon Switzerland," famous for many scenic wonders, consisting of bizarre rock formations set in attractive surroundings. Forests attract the sportsman. A large district near Brno, with soluble limestone, contains caverns, underground lakes and rivers, as well as attractive topography. Near Dobruška in southern Slovakia are the ice caves of the "Slovak Paradise."

The commercial significance of the Moravian Corridor, Elbe Gate, and passes leading out of Czechoslovakia has been great since prehistoric times. Recent centuries have seen commercial advantages enhance with the rise of industry and growth of population. Trade facilities were extended by the creation of a free port at Hamburg, the main outlet for Bohemian industry, and by placing Danubian commerce under international control.

Urbanization followed northwestern European patterns quite closely, but only two cities rose above the 200,000 class, and only one to giant status.



Czechoslovakia: index map

Prague, 0.922 million, in central Bohemia, at the head of navigation on a tributary of the Elbe, occupies an extremely old site. In medieval times it was a city of considerable stature surrounding the old castle of Vysehrad. Its wealth of buildings dating back to the Middle Ages is one of the richest in Europe. A university was founded in 1348. An industrial age brought factories making such products as iron and steel wares, machinery, sugar, glass, soap, chemicals, fertilizers, paint, varnish, lead pencils, leather goods, gloves, shoes, cottons and woolens, clothing, carpets, blankets, hats, lace, furniture, toys, musical instruments, railroad cars, and locomotives. Commerce required improvement of the upper Moldau and a canal to the Danube.

Brno, 0.273, in central Moravia (Mórava), lies west of the Morava (March) River and the Corridor, but has easy routes across and around the Bohemian-Moravian Highlands to Bohemia and Prague. It is famous for marble and manufactures woolens and other products. Local supplies of coal favored industrial development. Bratislava (Pressburg, Pozsony), to the south, is a commercial outlet for Moravia on the Danube.

Near the Moravian Gate are the industrial cities of Ostrava, Opava, Vitkovice, Teschen (Tesín), and many other towns engaging in a wide vari-

ety of industries on the basis of Upper Silesian coal and other resources.

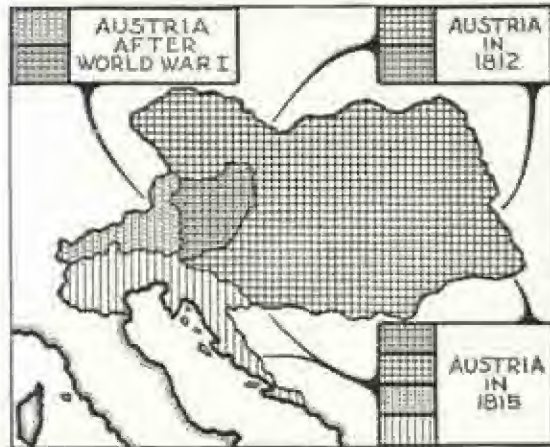
Pilsen (Plzen), somewhat southwest of Prague, is not only a great brewing center depending on local supplies of barley and hops, but it also has coal, pure sand, and other resources that established glass and other industries culminating in the Skoda munitions factories, which were among the most modern and efficient in the world at the start of World War II.

Textile making is widely scattered, much of it taking place in small towns where hydroelectric power is available, chiefly along tributaries of the Elbe. The raw materials have generally been United States cotton, Polish flax, and local wool. Glass and pottery making are also widely developed. Jablonec near the Elbe Gate is famous for its ornamental beads. In Slovakia, Svolen produces steel from local iron and coal. Kosice (Kaschau, Kassa) has long been a source of opal and mineral crystals.

World War II resulted in the loss of easternmost Czechoslovakia, with its Ukrainian population, to the Ukrainian S.S.R. Under the agreements of 1945 Czechoslovakia is to be included in the zone of friendly nations surrounding the Soviet Union. Recent seizure of Czechoslovakia by Communists, however, raises sharply the question of any real political independence remaining in the state. The 1950 population was 12.3 million.

20: Danubian Zone

The continuity of Slavic territory is broken by a Danubian zone of linguistic intrusion. In the basins of the upper Danube, German is the dominant tongue. Magyar dominates the lowlands of the middle basin. Rumanic Rumanian is the language of the lower basin. Of the main tributaries reaching the river from the north, only the Morava extends into any considerable area of Slavic population. For about half of its entire length the Danube approximates the northern boundary of southern Slavic territory. The intrusive zone is nearly bridged at the delta, but upstream it has a width of from 125 to over 300 miles. To the north lie the lands of the North, or West Slavs, while to the south are the South Slavs. Politically the intrusive zone starts upstream with small Austria, continues eastward with somewhat larger Hungary, and ends with Rumania, one of the



Austria, 1812, 1815, and 1918



Austrian city (Salzburg) (U.S. Army photograph)

largest nations in the Shatter Belt. Many enclaves of German-speaking people lie in both Hungary and Rumania. One large and several smaller enclaves of Magyar-speaking people lie in the heart of Rumania.

AUSTRIA

The Austro-Hungarian Empire, prior to World War I, covered 261,259 square miles and contained a population of 51 million. Austria today covers 32,369 square miles and in 1939 had a population of 7 million. It is a German state that has differed from its western neighbor, Bavaria, mainly in the fact that it was not a member of the German Empire, 1871-1918. It was occupied by Hitler's forces in 1938.

Most of Austria lies in the Eastern Alps. It resembles Switzerland and has about twice the area and population. About one quarter is under cultivation. In the higher parts it produces only hay, rye, and oats. Cattle are numerous. Hydro-electric resources are about half developed and several of the main railroads are electrified. Textile industries center around Dornbirn in the extreme west. A thriving tourist trade has long existed.

To the southeast, in Steiermark (Styria), are some excellent iron deposits and a little coal. Considerable heavy industry has been developed at Graz and other centers. In the extreme east is a fringe of lowland with dense population where agricultural conditions are good. Wheat and sugar beets are grown on flats and grapes on slopes.

Vienna Austria might have become a success-



Austria: index map

ful eastern counterpart of Switzerland, except for one fact. It included a city of approximately 2 million, Vienna (Wien). Because of location there was every reason why Vienna should be one of the great cities of Europe as long as it was capital of a large empire, but the economic problem of maintaining a city containing nearly one third of the population of little Austria as constituted in 1919 turned out to be impossible. Vienna declined and sapped the lifeblood of Austria, which was insufficiently rich to head off a lingering death. The once crowning glory of the western part of the Shatter Belt, the city whose prosperity had been based on an economy that had long crushed populations in the broad territory extending from the Adriatic to Polish Galicia, the seat of the Hapsburgs, has now descended to a Shatter Belt level of prosperity. Population declined more than 400,000 between 1910 and 1946.

Routes radiate from Vienna like spokes from the hub of a wheel. On the main one, along the Danube, Vienna is the gate between German and non-German territory. The Danube is navigable to German Ulm and leads to canals and passes of the Rhine Valley and all parts of northwestern Europe. Branches to the Inn through Austrian territory lead to Brenner Pass, the easiest gateway through the Alps to the Po Valley, with a summit elevation of but 4,485 feet, a route used at least as far back as the Bronze Age. Down the Danube are Budapest, not far away, and the wide basins



Danubian Basins: relief

of Hungary and Wallachia, as well as various routes to Istanbul (Constantinople), Asia, and Salonika on the Aegean. To the north are the Moravian Corridor and several routes to the Elbe Gate. To the south is Semmering Pass leading to Steiermark, the upper Drava, and to the head of the Adriatic. Such natural advantages mean little now that Vienna is victim to an impossible political and economic situation.

HUNGARY

The Alföld, the broad central Danubian basin, with extensive grasslands along the Tisza (Theiss) and other streams, has attracted many invaders. Those fresh from Asia have liked it best, because the semisteppe climate and vegetation came closer to resembling the attractive Ukraine than any territory crossed after leaving Bessarabia, Moldavia, or Wallachia. Attila and the Huns sojourned there in the fifth century. Avars reached it in the seventh century. In each case some of these Asiatics remained to blend with another, similar people who arrived in the tenth century, the Magyars. These settled in large numbers. Many of the Asiatics went farther, across passes to the head of the Adriatic or into the Po Valley, but the Alföld called them back and became the main central European outpost of Asiatic language and culture. Though the English name of the nation that developed in the central Danubian basin suggests that the Huns became its dominant people, such was not the fact. The Kingdom was known as Magyar Ország and their language is Magyar, a tongue more closely related to Finnish than any other west of the Soviet Union.

The Mongoloid stock of the Magyar and his Asiatic predecessors has been so diluted by Alpine, Mediterranean, Nordic, and Dinaric mixture that the Hungarians today are practically the same people as their neighbors. Their differentiation is almost totally cultural. It is sharp. Their Ural-Altaic language bears little resemblance to the Indo-European tongues on all sides. Their nomadic ways were modified or abandoned only with greatest reluctance. They have always feared Slavic encroachments and also assistance from alleged German protectors and benefactors. A long association politically with Austria had successfully prevented Slavic domination, but dreaded signs of strong pan-Germanism arose after the dissolution of the old empire. Toward their eastern and southern neighbors, Hungarians have always exhibited haughty contempt.

The Treaty of Trianon, 1920, reduced Hungary to dimensions considerably smaller than the predominantly Magyar territory. Some two mil-

lion Magyars lived outside of the country, as compared with less than eight million within. There was no way to include the majority of the expatriates without adding a majority of non-Magyars in the belt leading toward their densest concentration, in Transylvania. Here is a large, detached group, known as Szeklers (frontier guards), who moved eastward during the thirteenth century mainly for the purpose of resisting Mongol invasion. They found the lowlands of what later became central Rumania attractive and settled there, where they have retained Magyar language, culture traits, and political loyalty to this day. Many other Magyar territories could well have been given to the Hungary of 1920, but settlement terms after World War I were harsh toward all former enemies. Aside from the Transylvanian question, the western border of Rumania was drawn some twelve miles too far west. Czechoslovakia was created so as to include an important Magyar strip in Slovakia and Carpatho-Ukraine, and rich agricultural lands in Magyar-settled Banat for a distance of some thirty miles down the Tisza were awarded to Yugoslavia. Hungarians thus had many reasons for dissatisfaction with the boundaries of their nation.

Reduced to an area of 35,932 square miles, Hungary contains a population of 9.2 million, of whom about 85 per cent are Magyars. The leading minorities are Jews, 0.6 million; Germans, 0.5; and Slovaks, 0.2. The dominant church affiliation is Roman Catholic, but there is a strong Protestant minority.

Most of Hungary is a plain about 300 to 600 feet above sea level. Large rivers wind sluggishly and formerly flooded wide areas. The banks of the Danube are lined with barges, many of which are equipped with small waterwheels for grind-



Boundary of Hungary

ing grain, but the villages ordinarily lie well back on sites protected from flooding. Annual precipitation varies from about fifteen to twenty inches, falling off toward the southeast. Soils are fertile and calcareous, as are those in the somewhat similar climate of the forest border of the Ukraine.

The Great Alföld, the southeastern half of Hungary, mainly east and north of the Danube, long attractive as semisteppe grassland to the Asiatics, started to yield to extensive agriculture some four centuries after the arrival of the Magyars. On its rich soils grow wheat, barley, oats, maize, sugar beets, flax, hemp, tobacco, hops, potatoes, melons, and paprika.

Highlands that extend from Bakony Forest west of Balaton Lake, and across the Danube above Budapest to continue as low Carpathian spurs in northern Hungary, produce wheat and swine; they also produce grapes for Hungarian wines, most famous of which come from the northeast above Tokaj (Tokaj).

The Little Alföld along the valley of the Raab (Győr) near the Austrian frontier is the most prosperous part of Hungary, largely because agriculture is supplemented by industry and on account of proximity to the markets of Vienna and Budapest.

Within recent years somewhat over two thirds of Hungary has been cultivated, about 16 per cent is devoted to pasturage, 12 per cent is in timber, and 6 per cent is waste, consisting either of barren sand or wet swamp. These proportions were evolved slowly, not only because of the reluctance of the Magyar to turn to farming, but also because rather extensive reclamation projects were required. Swamps had to be drained and the Tisza had to be tamed. Sites best suited to agriculture were occupied first. Areas between were developed through a system of *puszta* farming, a pioneering that advanced into formerly unused territory, planting crops more useful for soil improvement than for the value of their harvest.

In common with other Shatter Belt countries,



Hungary: index map

Hungary suffered economically because most of the land was in large estates. But in contrast with conditions in the Baltic States and North Slavic territory, the landlords were not aliens. The Magyars themselves owned the estates. It was always difficult for a nomadic-traditioned Magyar to become a peasant. The peasant stock of Hungary is far more diluted with Slavic, Germanic, and other blood than is the aristocracy. With Magyars in control politically, there has been little agrarian revolution, such as occurred in most Shatter Belt states. In spite of reform laws passed in 1920, well over one third of Hungary remained in estates of 2,000 or more acres, until 1946 when a small landowners party elected over half of the members of Parliament, as part of a movement that is leading to breaking up of large Magyar estates.

For many centuries Hungary was a land of surplus timber, but restricted boundaries cut off so much of the supply that lumber now leads its list of imports. The main export item remained cattle and meat until rather recently, when wheat rose to the top of the list. Trade was traditionally in the hands of Germans and Jews. Industry has remained quite unimportant except for a fair amount of processing of agricultural products. Textile mills have difficulties because of climatic conditions almost precisely unlike those that account for the greatness of Manchester. Fibers snap from brittleness in the dryness of Hungarian summers. Some coal exists near Budapest and more near Pécs in the south, and about three quarters of the nation's modest needs are met by local petroleum, but fuel is not sufficiently abundant for large-scale industrial developments. About half of the fuel needs are met by lignite mined at Esztergom (Eszterbom) and Salgotarjan not far from Budapest. A little iron and good quantities of bauxite complete Hungary's meager list of mineral resources.

Urbanization has resulted in the growth of one large city, Budapest, 1.7 million. No other city has a population exceeding 150,000. Hungary is still a rural land, with its people living in villages. These take up altogether too much land because they were laid out in Asiatic patterns resembling the ways that nomads commonly arranged their tents. White-walled houses of tamped earth face each other across a roadway that is absurdly wide. This opening is a survival of the patch of grazing land that was provided for horses and livestock during nights. Paths and wheel tracks crisscross it in irregular patterns. Gardens surround the widely spaced houses. With limited fuel supplies and hardly any hydroelectric development, Hungarian villages turn black at night.

Budapest lies just below an old Roman outpost, the fort of Aquincum, located where the Danube is wide. Buda was established as a fort by the Germans where the river was narrow enough to bridge. Pest grew as a Magyar settlement on the left (east) bank of the Danube. The two combined form the largest thoroughly Europeanized city east of Vienna. Budapest is favored as a commercial center not only by location on the river but also because all routes from Slovakia converge toward it, and because a radiating, fanlike system of railroads spreads out to the south and southeast. Half of Hungary's industry is concentrated in the city. Its mills turn out more flour than those of any other European center. Sugar refineries, breweries, meat-packing plants, leather tanneries, shoe factories, cotton-weaving mills, chemical plants, glass factories, and shipyards are the most common industrial landscape forms.

Szeged, 135,000, in the south, and Debrecen, 118,000, in the east are flour milling centers. Miskolc, in the northeast, has some industry as a result of local iron mines. Győr, about seventy miles west of Budapest, though small, is highly industrialized, with factories making machinery, railway equipment, matches, brushes, bricks, and vegetable oils.

Fiume, on the Adriatic, was developed as a Hungarian port to more or less rival Austria's Trieste. The loss of these ports to Italy after World War I was a blow softened somewhat by the fact that Hamburg, although 300 miles farther from Budapest, is actually easier and cheaper to reach.

RUMANIA

Thracians, who were probably strongly Mediterranean in stock, lived in lower Danubian territory when the Romans arrived to establish an outpost against Scythian or other barbarians who might threaten their territories by a route up the river in the first century A.D. The Romans found gold and other metals along the mountains north of Wallachia, but the colony of Dacia served mainly as a place to which the unruly or politically unacceptable might be banished. It lasted for about 150 years, into the third century.

Withdrawal of the Romans left Dacia free for invasions by Slavs of various types, Nordic Goths, Huns, Tatars, and, eventually Turks. The Romans fled to Transylvanian highlands when these barbarians began to arrive, and there maintained the language bequeathed to them by the Romans. Later they moved down into the plains of Wallachia and Moldavia. In the twelfth century they received an influx of Latin colonists. In many

ways Rumanian is fundamentally closer to Latin than is present-day Italian, but its vocabulary includes many Slavic nouns that ordinarily refer to commonplace objects, especially those familiar to peasants. Most terms that refer to religion, government, or objects of culture are Latin. In all, Rumanian exhibits the characteristics of a colonial dialect, conservative as to structure and many idioms, but rich in loan words.

While Rumanians consider themselves as racially close to Latins, they are actually predominantly Alpine. Their religion has come from the Eastern Church rather than Rome, and a great majority of their culture traits are of Slavic origin. In many ways it is the Shatter Belt nation least influenced by the cultures of western Europe. It has the highest birth rate in Europe, 370 per 10,000, and also the highest death rate, 120. Every four years its population increases by about one million.

The Romani who gradually occupied Wallachia and Moldavia during the thirteenth century lived more as scattered tribes than as a nation. They were subjected to rule by Magyars, Poles, and ultimately Turks, who remained in power for about 400 years. The Turks themselves didn't settle north of the Danube, but rights to govern Rumanians and others were sold by them to the highest bidders. In 1774 some tokens of self-government were granted the Rumanians, but it was not until 1858 that Wallachia and Moldavia attained true freedom. During the Russo-Turkish War, Rumania welcomed and granted passage to Russian troops across its territory. By the terms of the Treaty of Berlin in 1878, however, the Russians were permitted to retain Bessarabia, the eastern part of Rumania, in return for which the



Rumania: Index map

Rumanians received alien Dobrudja, with a Bulgar population.

During World War I, Rumania fought on the side of the Allies, rather ineffectively but bravely, with losses amounting to more than seven times those sustained by the Belgians. As a reward it was allowed to keep southern Dobrudja, and it was given Transylvania, part of the Banat, Bukovina, and Bessarabia. From the shape of a wiener wrapped around the southern Transylvanian Alps and southern Carpathians, it had expanded into a balloon. Its territory had more than doubled but so had its minorities, who now constituted some 30 per cent of the population. The minorities included about 1.6 million Szeklers and Magyars, 1.2 Ukrainians, 0.8 Germans, 0.8 Jews, 0.3 Bulgars, and 0.2 Turks. The Jewish minority amounted to 1.4 million, including Christian Jews. About half of Rumania was conquered by the Red Army in 1944 and northern Bukovina and Bessarabia were retained by the Soviet Union after 1945. Southern Dobrudja was returned to Bulgaria in 1947. The area of Rumania once rose to 122,000 square miles and the population to 19.8 million. With present boundaries it amounts to 91,584 square miles and a population estimated to be 16.5 million.

About 80 per cent of the Rumanians are peasants engaged in agriculture and stock raising. They are a genial, well over half illiterate people who are individually about one third as efficient as peasants in northwestern Europe. In religion they exhibit almost total adherence to the Eastern Church, but they are extremely tolerant of other beliefs. In politics they are wholly inept, having no concept that governments may be run without rampant corruption. As in other Balkan lands they spend several months per year worrying about the probability of hail, the great destroyer of crops. As precautionary insurance they like to have their tiny fields scattered, so that at least some of them lie outside the zone of devastation of any particular storm. Rural population density is great, in excess of 150 per square mile in most parts of the country and above 200 in some. Since the agrarian reforms of 1918 and 1921, no landholding could exceed 200 acres, but most farms were smaller than that. By Rumanian standards the reform has been successful and productivity has increased.

Some 60 per cent of the land is agricultural and 92 per cent of it is divided into small farms. About 25 per cent of Rumania is in forest, yet only 4 per cent of the population engages in forest industries. Mineral wealth is great, including petroleum, salt, natural gas, lignite, gold, iron,

copper, and zinc; yet only 8 per cent of the population is industrial. These resources have been exploited to some degree by foreigners, but the returns have not been satisfying either to the operators or the Rumanians, in either case having been so diluted by local political corruption that unreasonably small balances have been retained. Mining occupies only 1 per cent of the population. Petroleum output has been rather large, but the fields have suffered from overdrawing and unwise development. The reserves seem to have been depleted with a great deal of waste, and potential production is now thought to be rather small. Commercial pursuits occupy about 4 per cent of the population. About 3 per cent are in governmental or professional posts.

Maize and wheat are the leading crops, the latter being raised in greater quantity than in Hungary. Barley, oats, rye, hemp, flax, sugar beets, tobacco, potatoes, and soybeans are other important crops. The area in vineyards is one fifth as great as that in France, but no Rumanian wine has ever attracted a foreign market on account of its quality. Fruit, especially plums for brandy, is relatively important. Sheep are numerous, as in Mediterranean countries, but other forms of livestock are less abundant than might be expected in a country with 80 per cent peasant population. One third of all peasants own no draft animal.

On the whole, Rumania's place commercially is that of an exporter of raw materials. Cereals constitute some 60 per cent of the surplus, mineral products 16 per cent, and forest products 16 per cent.

Wallachia, old and nuclear Rumania, is the broad plain north of the Danube, east of the Iron Gate, and west of the delta. Toward the river are wide marshes covered by willows and reeds where wild ducks, geese, pelicans, herons, and similar birds abound. In the river itself are salmon, sturgeon, and pike, which provide a living for a considerable population. Lands marginal to the marshes receive only about ten inches of precipitation and are generally too dry for agriculture. Sheep are pastured on their scant grass crops. Precipitation increases toward the north, and above the steppelike zone is a region corresponding to the better black earth belt of the Ukraine where chernozemlike soils produce the vast amounts of maize and wheat that are available as items of export.

The word, corn, in English means grain and ordinarily refers to wheat. In American it means maize, or "Indian corn." Few people outside of the Americas can be induced to eat maize. The South Africans, for example, produce a great deal, calling the grain *mealies*, but they raise it only

for livestock. "Roasting ears" are seldom to be seen in Europe except in a few hotels that cater to American tourists or in the homes of people who have traveled in the Americas and have overcome the prejudice against them. Corn meal has been rejected by people on the verge of starvation. There are no valid reasons why maize should not be eaten any more than millet and other grains against which Americans ordinarily exhibit prejudices. If we should suffer a famine it might be difficult for us to make much use of a shipment of grasshoppers or maggots sent by some benevolent people who regard them most highly. Among Europeans, the prejudice against maize is least felt in the Balkans and particularly in Rumania. Among Wallachian peasants it is the chief food.

The villages and towns of the Wallachian Plain are located at wells, springs, or valley mouths where water is available. Ferry towns exist along the Danube, but the river is bridged only at either end of the plain, at Turnu Severin, at the Iron Gate—a canalized rapids below the Kazan Gorge—and at Cerna Voda on the most direct route from Bucuresti to Constanta on the Black Sea.

North of Bucuresti along the foothills of the Transylvanian Alps are petroleum and natural gas supplies for the refineries at Ploesti. These fields have produced about one quarter of Europe's petroleum.

Bucuresti (Bucharest), 1,042,000, is the slowly modernizing capital of Rumania. A walled town in the sixteenth century, it has developed into a huge political, commercial, and educational center. Some 20,000 students are enrolled in its university. Modern stores and office buildings, like those in Russia, contrast sharply with the humble dwellings in which most inhabitants live. Industry is favored by nearby petroleum and salt resources. Refined oil, chemicals, and bricks are among the manufactures. Food processing, sugar refining, meat curing, and brewing are relatively important. Some furniture is manufactured, and extensive shops repair railway equipment. Some textiles are woven.

Craiova is the leading grain market and commercial center of western Wallachia. Galati (Galatz) and Braila, on the Danube, are the main ports for grain export toward the eastern end of the plain. The latter lies at the head of a channel that is kept dredged to a depth of eighteen feet; and the city is rising industrially as a producer of cement, textiles, flour, sugar, chemicals, beer, and forest products. Galati lies in Soviet-disputed territory.

Moldavia, Bessarabia, and Bukovina more or less continue the Wallachian Plain around the eastern side of the Carpathians. Bessarabia and

northern Bukovina now form part of the Soviet Union. Moldavia lies between the mountains and the Prut (Pruth), Bessarabia between the Prut and the Dniester, and Bukovina to the north, next to Polish Galicia.

Bessarabia was settled originally by Rumanians, but the Russians developed it economically. The towns are chiefly populated by Jews. There are about 2.8 million each of Rumanians and Ukrainians, the latter concentrated northward. In 1914 it was estimated that less than 15 per cent of the population could read Rumanian. Rumanians and Ukrainians now constitute about 70 per cent of the population. The leading minorities are Jews, Germans, Great Russians, Bulgars, Greeks, and Tatars, in non-too-compact units.

The boundaries between Ukrainian mixed forest, forest borders, and steppe converge toward the junction of the Prut and Danube. The lowlands of Bessarabia toward the Black Sea are arid, but northern Bessarabia and most of Moldavia were originally forested, and Bukovina was densely covered.

Chisinau (Chiseney), 117,000, is an agricultural manufacturing city in the Bessarabian continuation of the black-earth belt, with fertile surroundings somewhat like those of Kiev. Odessa is its natural Black Sea outlet, but political considerations have diverted much of its trade southward to Galati (Galatz), 106,000, on the Danube. This market town is a strong rival of Braila as an export center for grain, and it also has some industry making glass, bricks, lumber, and ships. Iasi (Jassi), 103,000, is the Moldavian rival of Bessarabian Chisinau, lying almost due west across the Prut. It is chiefly commercial, and has an extremely heavy Jewish population. Cernauti (Czernowitz), 110,000, is the leading city in the upper Prut valley and political center of Bukovina. Originally a cultural center, with a strong German population, it is an Ukrainian city at present and has developed considerable industry in processing food and making glass.

Carpathians lie west of Bukovina and Moldavia. They are lower and less scenic than the Alps, but more highly mineralized. Alpine vegetation in the uplands supports sheep and goats. Coniferous forest below is an excellent resource for timber. Mixed forest on lower slopes is cleared for vineyards and fruit orchards including large tracts given to raising plums for Damson brandy. Toward the south is the scenic Harghitta, a mass of volcanic rocks. Grazing, lumbering, salt mining, and agriculture at lower elevations are the main occupations. Brasov, 56,000, at the extreme south, is a

German commercial center, rapidly gaining political and industrial importance, making tanned leather, cloth, knit goods, furniture, paper, chemicals, refining petroleum, and even manufacturing airplanes. Predal Pass leads south to Ploesti and Bucuresti.

Transylvanian Alps are one of the beauty spots of Europe, generally woefully neglected by western tourists. Here the Romans sought protection at the time of the Magyar invasion of Wallachia, and both Rumanians and Magyars found shelter during the darkest days of Turkish power. Culminating summits rise above 8,000 feet. Sheep graze on Alpine fields above 6,000 feet in summers. Coal, iron, gold, silver, lead, and copper are mined in the west. Salt is mined on the south slopes north of Ploesti. Valleys are densely inhabited with peasants raising maize, wheat, oats, barley, hops, sugar beets, potatoes, tobacco, and grapes. Hogs fatten on mast in the deciduous forest and maize from the fields. Cattle, horses, and camels serve as draft animals.

Transylvania is a region of strong minorities. The Rumanian population is dominant and amounts to about 1.9 million. There are about 1.0 million Szeklers and Magyars and 0.25 Germans. The latter are invariably called "Saxons" in spite of the fact that their ancestors came mainly from the valley of the Mosel (Moselle). Most of these Germans are Protestants. Other strong minorities are Jews and Gypsies. Magyars own most of the land and are soldiers, while Germans and Jews control trade. The Rumanians are the peasants. Toward the west is a heavy Serbian population, South Slavs.

Lowland Transylvania is far more progressive than most parts of Rumania. It is also picturesque. Houses are isolated to a degree uncommon in the Balkans or lands to the south and west. They are constructed of stone and have slate roofs. To the west, where Serbian influence is strongest, a great many are painted blue. A rather characteristic type of architecture prescribes a long porch with doors leading to each room.

Cluj, 97,000, is the commercial and political focus, with railroads leading in all main directions. Oradea, 80,000, lies to the west at the margin of the Hungarian Plain. It has considerable trade in lumber, wool, and food products, and it manufactures some machinery. Though Transylvania produces some 70 per cent of Rumania's coal, it is

not highly industrialized. Less than 2 per cent of its water power is utilized.

The Banat is a lowland that continues the topography of the Alföld southeastward. Politically it is divided mainly between Rumania and Yugoslavia. An original Magyar population fled during Tatar times, after which Serbs drifted in, especially during the days of Turkish control. Between 1552 and 1718, when the Banat passed into Hapsburg hands, it was a desolate region but attracted refugee settlers from many lands, including Rumanians, Germans, Croats, Slovenes, Italians, and even Spanish colonists. By 1939 there were about 3.2 million Rumanians, 1.5 Magyars, 0.5 Germans, 0.1 Jews, and 0.2 other peoples. Arad, 77,000, to the north is a typical Magyar market city for livestock, cereals, fruits, and garden produce. Timisoara (Temesvar), 92,000, some 30 miles to the south is industrial as a result of nearby fuel, iron, copper, and lead.

Dobrudja (Dobrogea) is a low, arid upland that deflects the Danube northward for about eighty miles before it makes the sharp bend at Galati to flow eastward to its delta and the Black Sea. In the extreme north is the marshy territory of the Danube delta, inhabited mainly by Rumanians. Fishing brings in a revenue of some one hundred million dollars per year. The Sulina mouth of the Danube is an improved channel notable for its export of wheat. Other channels are subject to shifting and shoaling.

The Greeks colonized Dobrudja. Political control passed to Romans, Byzantines, and Turks. Until very recent times, the peoples most attracted to this arid grassland have been Asiatics. The Bulgars arrived in the seventh century, and though Slavicized, they retain many of their Asiatic culture traits. Various Tatar and Turkish tribes have settled in Dobrudja south of the Danube. Gradually a Rumanian majority accumulated to the north and a Bulgarian one to the south. As a result of the Second Balkan War, Rumania came into possession of southern Dobrudja in 1913. The transfer meant little to Rumania, but it deprived Bulgaria of 10 per cent of its territory including some fine maize land and copper deposits.

Constanta, 58,000, lies far enough from the delta to be untroubled by silt. Its harbor, in the shelter of a sandbar, remains unfrozen in winter and hence attracts a good share of trade that is unable to use the Danube. A pipe line brings petroleum for export, but wheat is its main item of commerce.

21: Southern Slav, Albanian, and Turkish States

The Slavs north of the Danubian zone speak western Slavic languages. Those to the south speak languages of the eastern branch, which are closely related to Russian. West Slavic tongues have adopted Latin alphabets, which are not particularly well adapted to the sounds demanded by the spoken word. Hence it has been necessary for them to employ many diacritical marks that are unused in western Europe. Most East Slavic languages use the Cyrillic alphabet, which originated in the ninth century. It employs both Greek and Latin letters and adds a number of additional symbols of its own.

BULGARIA

Slavicized Bulgars ruled much of the Balkans between the ninth and twelfth centuries. In the fifteenth century they came under the Turks to suffer nearly five centuries of oppression. The Treaty of Berlin, 1878, created a Bulgarian principality under Turkish suzerainty, but not until 1908 did their nation become completely free. Subsequent history has been unhappy. Within 30 years Bulgaria took part in four wars that exhausted its manpower and resources, leaving almost no national wealth.

Bulgaria as now constituted has an area of 42,796 square miles and a population of 7.2 million. It is compactly Bulgar territory. Any expansion would take in more non-Bulgars than nationals. Over 80 per cent of the population belong to the Eastern Church and about 15 per cent are Moslem. These Mohammedan Bulgars are called Pomaks. Many Pomaks appear to be Greeks or to have had other non-Bulgar origins. There is a Turkish minority of about 0.5 million, but they are not a compact group and appear to be without irredentist tendencies. Considerable Bulgar population lies outside of the nation in Greece, Yugoslavia, and Rumania. The people of Macedonia are so mixed culturally that they practically defy unscrambling. The Slavic-speaking people in the medley like to consider themselves Bulgars, and Bulgaria bases a strong plea for territorial extension to the Aegean on the claim that they are. There are, however, more non-Bulgars

than Slavs in that territory, as is also the case west of the Balkan Mountains in the parts of Yugoslavia where Bulgars are most numerous. Even in southern Dobrudja, where Bulgars long outnumbered Rumanians, they form less than a majority today.

The loss of southern Dobrudja in 1913 was a severe blow to Bulgaria because it deprived the small state of most of its grain surplus and a quarter of its agricultural machinery. The Rumanians immediately carried on a harsh campaign to take over Bulgar landholdings and succeeded quite thoroughly but they were forced to return sovereignty to Bulgaria after World War II.

About 80 per cent of the Bulgarians are peasants who live in villages, which may lie as far as four miles from their fields. As in Russia, domestic industries are highly developed and commerce is



The Balkans: Middle Ages political divisions

practically nonexistent in rural areas except for the sale of a small agricultural surplus and a few essential purchases, such as soap, salt, coffee, and paraffin. Modern conveniences are hardly known. Such a strong prejudice exists against railroads that tracks are routed around villages and towns, so that most stations occupy lonely sites.

About one third of Bulgaria lies north of the Balkan Mountains and drains into the Danube. The lower territory is similar to the better parts of Wallachia, being thickly settled and productive with wheat as its leading crop. In many places Moslem minarets rise above the sky line to recall the presence of the Turk in lands south of the Danube.

Ruschuk (Ruseuk, Russe), 50,000, a Danubian port, is the chief wheat-shipping point and handles about one third of all Bulgaria's imports. There is some agricultural manufacturing, mainly processing hides and refining sugar. *Varna*, 72,000, a Black Sea port, is located practically on the border of Dobrudja. It supports chemical industries and agricultural processing and serves as an outlet for fruits and other Mediterranean products, which grow along the coast.

The Balkan Mountains are less picturesque than the higher rungs in Rumania. Their rounded summits pasture sheep, while limited deciduous forests support a small lumber industry. Coal and copper mines furnish industry with some raw materials. In basins and valleys, however, the peasant population is dense. Both wheat and maize are raised in the rainier west. Eastward the con-

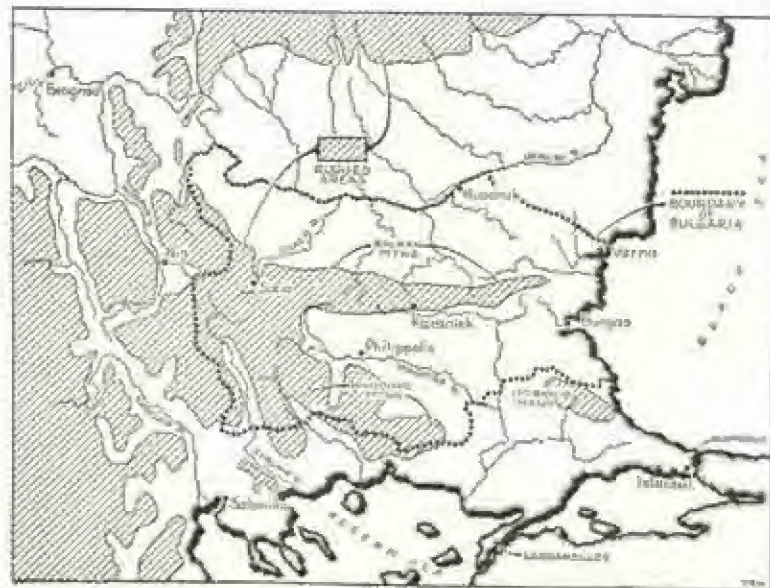
centration is on wheat, but toward the Black Sea are orchards, vineyards, and fields of tobacco. Fruits include apples, plums, and cherries. Walnuts and chestnuts add to the Mediterranean character of agriculture. Sunflowers, a source of vegetable oil, are raised in great quantities in drier places.

Sofia, 0.43 million, located in a basin in the western Balkans, is notable for its many radiating routes. The Morava (not to be confused with the Morava of the Moravian Corridor) leads southeast from Beograd (Belgrade) not far from the junction of the Tisza (Tisa) and Danube. At Nis (Nish) the Morava route branches to form one of the most important junctions in the Balkans. One line of passes and valleys leads to Salonika (Thessalonike) at the northwestern corner of the Aegean and the other to Sofia from whence there is easy access along the Maritsa (Evros) through Trajan's Gate to Istanbul, Asia Minor, or the Bulgarian port of Burgas (Bourgas). Sofia thus lies on the "Berlin to Baghdad" route. To the north the Isker Valley leads directly to the plains of the lower Danube. Another easy pass leads to the Struma Valley and the Aegean. Surrounded by orchards and fields growing such crops as sugar beets, potatoes, peas, and beans, Sofia is an important market center and refiner of sugar. Its mills weave carpets, rugs, cotton and woolen cloth, while industrial plants turn out brick and tile.

East of Sofia, especially in Kazanlek Basin, are some eighty villages that specialize in growing Damascus roses. Here in the "Valley of Roses" women and children rise early to pick buds before they are opened. From anywhere up to 5,000 petals comes an ounce of attar of roses, a jellylike base for perfume. Most of this product is exported to France and Turkey.

Burgas, 50,000, is the Black Sea port for the southern Balkan Mountains. In addition to wheat, tobacco, maize, and other agricultural exports, it sends copper to Belgium, manufactures salt from sea brine, refines sugar and petroleum, makes soap, and weaves some textiles.

An extensive lowland south



Bulgaria: Index map

of the Balkan Mountains leads from Eastern Rumelia eastward along the Maritsa. The main river turns south to the northeastern Aegean north of the Dardanelles, but the lowland continues eastward to the Black Sea between the Balkan and low Istranja Mountains. Burgas lies in this lowland, but its rail connections and significance are tied to the Balkan Mountains.

Philippopolis (Plovdiv), 100,000, is the commercial center of the Maritsa Basin between the Balkans and the Rhodopes. Founded in 350 B.C., by Philip of Macedon, the city has become a tremendous center of tobacco raising, exporting much of the "Turkish" tobacco that reaches western Europe and the United States. Silk mills and food processing establishments are the main industrial activities. The natural outlet for this region is southward along the Maritsa, and the Bulgarians rarely overlook an opportunity of asserting claims in that direction. There is little cultural justification for such territorial acquisition, but commercially it would be highly desirable to obtain a strip of Aegean coast, a luxury known to Bulgars between 1913 and 1919.

The Rhodope Mountains are high and rugged. A touch of Ice Age glaciation enhanced their scenery. The inhabitants are either mountain people or valley agriculturists without cities or towns. Sheep, lumber, porcelain clay, tobacco, and fruit are the chief products.

Bulgaria could have an extremely good economic position if political conditions would ever quiet down enough to permit development of its resources. Eastern Rumelia and other parts of the country are fertile and could be highly productive. Considerable coal is mined, and varied mineral resources await development at many places. The products are so varied that the evils of one-crop agriculture need never harass it. The peasants are industrious and highly democratic. Recent wars, at a frequency of less than eight-year intervals, however, have made it one of the most backward states in Europe.

YUGOSLAVIA (JUGOSLAVIA)

East Slavic-speaking peoples moved from southern Russia into the valleys and highlands north and east of the Adriatic as early as the sixth century. By the twelfth century some of them had established the Serbian state with a capital at Prizren for about two centuries. Turks arrived in 1389 and remained for nearly 500 years. Some of the Serbs retreated to Black Mountain (*Crna Gora*), where they remained free in a country called Montenegro until their king sold out to Austria in 1915. Other Serbs rose against the

Turks in 1804, and a small area was freed in 1817. In 1878 Serbia became a nation. The Serbs, though dominant, are only one of the many peoples in Yugoslavia (*Kraljevina Jugoslavja*).

In late 1918 a curious nation was created and named "The Kingdom of the Serbs, Croats, and Slovenes." In 1929 it became Yugoslavia, the nation of the South Slavs. In 1945, in the Soviet sphere of influence, it became a satellite republic. It is now independent, but communistic.

The population of 16.3 million includes 8.4 million Serbs; 3.6 Croats; 4.5 Slovenes; and minorities of 0.6 Germans; 0.5 each, Magyars and Albanians; 0.3 Rumanians; about 0.5 miscellaneous Slavs; and other scattering peoples of whom Italians are most numerous. The Serbs, being in a majority, have always wanted a centralized state, but the Croats and others have fought for local autonomy.

Serb and Croat speak practically the same language, but differ in that the Serbs use the Cyrillic alphabet and the Croats the Latin. This distinction follows religious affiliations. Most Serbs belong to the Greek Catholic, and most Croats to the Roman Catholic, Church. Slovenian is a quite different language, and the Slovenes, who are Roman Catholic, are partially Germanized as a result of close association with Austrians.

The Serbian nucleus lies in the east in rugged territory close to the Morava-Vardar route from the central Danubian basin to the Aegean. Along this route came ancient Greeks to settle in Hellas. Illyrian robber tribes discouraged the Romans from using it, but Ostragoths followed it in A.D. 473 and one of Europe's most famous trains, the Oriental Express, speeds along the Morava, with sections for both Athens and Istanbul which separate at Nis, where there are connections for Rumania by way of the Timok Valley. Rather easy passes determine routes westward from the Morava Valley to Sarajevo, from whence minor railways lead across difficult Dinaric uplands to the Dalmatian coast. Skoplje, in the upper Vardar Valley, lies on routes northward along the Ibar Valley and southwestward to Lake Ohrid (*Ochrida*) and Albania. The Serbs dominate these strategic lands. Nis and Skoplje are their nodal points.

Serbian sheep and cattle for centuries have been driven to highlands for summer pasture and down into the valleys for winters, a type of seasonal moving called *transhumance*. Irrigation has been in practice for more than a thousand years. Fields now grow rice, cotton, sesame, and a variety of vegetables. Slopes support vineyards and orchards

of apples, pears, peaches, and plums. Mulberry leaves provide food for silkworms. Mines once used by Romans continue to produce lead, zinc, copper, and iron. Skopljë has grown into a route and market town of 65,000, and Nis to 25,000.

Serbs spread southward into Macedonia along the Vardar route from Skopljë. Austria long regarded this as an excuse for territorial extension to the Aegean, as did the Serbs themselves when they went to war with Turkey in 1912. Salonika is the best possible seaport for Beograd and most of Yugoslavia, but it has been kept in Turkish or Greek hands during recent centuries.

The spread of Serbs northward led them to the Central Danubian basin, to the Banat, southern Alföld, and Slavonia. The most densely populated part of Yugoslavia today lies between the Sava, Drava, and Danube. Wheat, tobacco, and wine are the important income-producing crops, but maize is also raised along with sugar beets, raisin grapes, and other crops. Pigs and beef cattle are the chief livestock. Incomes are supplemented by agriculture. Subotica, 102,000, is a food-processing, peasant city on the Hungarian border. Novi Sad and Osijek are market towns and railroad centers farther south. Beograd, however, is the great city of the Serbian plain.

Beograd (Belgrade), 0.391 million, lies at the

junction of the Sava and Danube. The Roman equivalent (*Semendria*) was a few miles east at the Morava-Danube confluence. No city has suffered more raids and occupations than this Serbian "White Castle." Hun, Avar, Byzantine, Greek, Bulgar, Serb, Turk, Hungarian, and Austrian have laid it low, but it has always risen again and today is the great Serb stronghold. As capital of Yugoslavia it is a bad choice, just as Prague is for Czechoslovakia. Croats, Slovenes and others are subjected to having their capital not only remotely situated but also in a territory that is wholly Serbian. To people with cultures largely influenced by Austrian associations, the Balkan capital presents an inhospitable atmosphere with its extensive Turkish slums not far removed from its modern buildings. But to citizens of a country with only 700,000 industrial workers out of a population of 16.2 million, an agrarian trade and commercial center might not be so alien as one of the industrial cities in western Yugoslavia. Beograd is primarily a trade and traffic center rather than a manufacturing city.

To the west of the purest Serbian strongholds are the once-forested Bosnia and the rough, arid-appearing, limestone lands of Hercegovina. Slavs arrived here, in old Roman Illyria, during the seventh century. The Bosnians adopted Bogomilism, a religious creed that advocated a sort of primitive communism and permitted no priest

class. Roman Catholic Magyars launched a crusade against these nonconformists in 1250 and so persecuted them that the Bogomils sought protection from the Turks against their fellow Christians in 1463. The Turks were comparatively tolerant and Bosnians so admired their ways that many were converted to Mohammedanism, which they retain to this day. In 1918 the Bosnian population consisted of 43 per cent Serbs of Greek Catholic faith, 32 per cent Moslems, chiefly of Serbian origin, and 19 per



Yugoslavia and Albania: index map

cent Roman Catholics, who were mainly Croats. These peoples do not live in compact groups and there is no possible way to draw political boundaries among them. Nothing short of forced emigration could unscramble the difficult Bosnian religious situation.

Sarajevo, 78,000, is the Bosnian commercial center, with three railroad routes radiating from it. Its bazar is considered to be the most impressive oriental feature in Europe. The population is nearly 40 per cent Moslem. Spanish Jews are numerous. Industrial workers manufacture cutlery, swords, woolens, and leather goods, process tobacco, and engage in woodworking industries.

The mountains between Serbia-Bosnia and the Adriatic rise to heights in excess of 8,000 feet and were partially glaciated. Escaping Turkish conquest, they permitted the survival of primitive cultures not unlike those of Albania. In places they are densely forested. Swine feed on oak and beech mast. Leather and woodworking industries occupy some of the inhabitants. A little copper and silver are mined, but most mineral resources remain unexploited. Gold, iron, and zinc are known to be available. Little use has been made of potential water power. One of the characteristic occupations is that of gathering wild herbs, such as gentian, lavender, belladonna, and thyme. Another is raising geese and turkeys. In the limestone regions topography is roughened by solution depressions, and landscapes appear barren even though the precipitation may be abundant. Thousands of little, saucerlike basins, *dolinas*, support peasant fields. In some cases lines of basins follow old valleys, *poljes*, where strips of soil permit the raising of two typical cash crops—tobacco and wine grapes.

The Adriatic coast, Dalmatia, is well over 200 miles in length and at most places is less than 35 wide. Long the home of Illyrian pirates it was settled by Croats who readily adopted the same profession and became the only Slavs who have ever attained a seafaring culture. Lowlands are quite barren. Of more than 600 islands along the coast only 62 are inhabited. Little forest remains on the slopes leading to the Dinaric and other mountains along the flanks of Montenegro, Herzegovina, and Bosnia, though in ancient times they were important sources for timber. After deforestation the slopes became grassy. Now they are partially given over to vineyards and orchards, which produce various fruits, pomegranates, and pistachio nuts. Cattle, marble, and bauxite are among the exports.

Italian influence has always been strong along the Dalmatian coast. During the days of the Austro-Hungarian Empire, Italian was recognized

as the official language and today it is generally spoken in the towns. Venice long owned many of the ports. The Dalmatian copied the Venetian in turning to the sea for sardines, tunny, or for commercial reasons. The Bay of Kotor (Cattaro) is an excellent harbor but lacks hinterland. Behind its palms, oleanders, and pomegranates are barren mountain slopes. Dubrovnik (Ragusa), farther up the coast, is a typical Mediterranean city that suggests Italy rather than a Balkan state. For many centuries it was an important city-state. Split (Spalato), 44,000, about midway along the coast, is Yugoslavia's leading seaport, but like all other harbors south of Fiume has insufficient hinterland to be of much importance.

Istria is about evenly divided between Italians and Croats, the former dominating the west coast as far as Pola. To the east of the peninsula the Magyars built their port of Fiume and to the west the Austrians built Trieste. The city populations have become strongly Italian since World War I, but the rural areas surrounding them are Croatian. Susak, across from Fiume, is wholly Dalmatian, serving as a commercial center and export point for Yugoslavian lumber.

The interior Croats differ from the Dalmatians in lacking inclination toward seafaring and in escaping recent Italian contacts. Their land, part of the Roman province of Pannonia, was overrun by various invaders, mainly Germanic, before being occupied by the Croats. A kingdom was established in the tenth century. After conquest by Magyars in 1102, Croatia was permitted to have its own duke and parliament. Turks appeared in 1526, but their rule was short and left few traces. Zagreb, 292,000, cultural center and traditional capital of the Croats, is more central European than Balkan in atmosphere. Its Jews speak German Yiddish instead of Spanish Sephardic as in Serbia. Serbs have been attracted to the fine soils of the upper Sava but have remained quite distinct—on a religious basis of Greek versus Roman Catholicism. Zagreb is a commercial, political, educational, and railroad center, with many financial interests. It refines petroleum and manufactures paper, though its main industries are agricultural—milling, brewing, and food processing.

Slovenian is quite a different language from Serbo-Croatian and culturally the Slovenes resemble Tiroleans in many ways. Slovenia was spared Turkish conquest and escaped wars to a greater degree than the rest of Yugoslavia. Serbian losses in World War I amounted to over a million, or practically one fifth of the population, but

comparatively few Slovenians were involved. Close association with Austria has resulted in Roman Catholicism and the adoption of many Germanic culture traits, but the Slovenians are proud of their Slavic heritage and have resisted complete Germanization very successfully.

The Julian Alps are not very high, but they contain widespread forests of oaks, beech, chestnut, and coniferous trees. Lumber and charcoal are produced in quantity and are exported from Susak and Fiume. Coal, iron, zinc, lead, and antimony have established local metallurgical industries, many of which center in Ljubljana, 60,000, the leading political and cultural center of Slovenia. Cotton weaving and glassmaking are important industries. Education in Slovenia is advanced high above Balkan standards and its 1.5 million inhabitants proudly lead the world in per capita production of books.

As a whole, Yugoslavia is a backward, agricultural, peasant country with about 75 per cent of its population on farms. Only about 25 per cent of the area is flat enough for producing field crops efficiently, but about 60 per cent of the land is cropped or pastured. Some 30 per cent remains in forest. As a producer of raw materials it has surplus agricultural products, ships lumber, and produces quite a variety of metals, of which copper is the leading item—no other European nation mining as much. Quite undeveloped are deposits of iron, lead, bauxite, chromium, and antimony. Its communications include some of Europe's most important routes, but on the whole it is a difficult country for highway and railroad construction. The fertile interior is not served adequately by any port. Though Split and Sušak have modern docks, they lie across territory expensive to cross rendering them far less useful than an Aegean outlet would be. The most serious handicaps, however, are of human origin. Here have arisen religious hatreds, clan feuds, political misfortunes, and wars typical of the Shatter Belt at its worst. Cultures are so fragmented and contrasts between them so sharp that their adherents have given each other little opportunity to take advantage of the endowments of nature.

ALBANIA

South of the South Slavic zone of the Shatter Belt is marginal territory largely occupied by non-Slavic peoples. Here, Dinaric Albanians form a compact unit to the west and Turks a small and less compact group to the east. Between them lie mixtures of Alpines and Mediterraneans, generally

known as Macedonians and Greeks. The Macedonians are confused peoples both racially and culturally. Many consider themselves as Serbs and others as Bulgars for reasons having little basis in actual heredity. Mediterranean Greek stock is also strongly represented.

Illyrians originally occupied at least the southern half of the Balkans. They were invaded by Greeks, Goths, Serbs, Bulgars, and other groups. Those along the Adriatic coast felt impacts of Greeks, Venetians, Sicilians, and Normans. The reaction of many Illyrians was simply that of withdrawing to mountains, where they remained rather pure and organized in small quarreling clans. When the Turks came in 1431, the Illyrians murdered tax collectors but escaped oppression. Toward Turkish missionaries, however, they were more tolerant and most of them became converts to Mohammedanism.

Of the population of 1.2 million in Albania, about 70 per cent are Moslems today, mainly in central Albania; 19 per cent Roman Catholic, along the coast; and 11 per cent Greek Catholic, around the fringes of the Mohammedans. Land is chiefly in the hands of the Moslems as a result of dispossession of Christians shortly after the main period of conversion. There is little religious persecution of any kind at present. Albanians gladly observe all of the church holidays of the three main faiths.

Thracian-Illyrian was one of the earliest Indo-European languages in Europe. It survives only in Albanian, but that tongue has added a vocabulary of loan words from Slavic, Hellenic, Latin, and Turkish sources.

Long isolation has resulted not only in preservation of an ancient tongue but in survival of many other culture traits as well. Clan and tribal affiliation is still the main political organization with strong rivalries between different groups. Ancient moral and legal codes, the Laws of Lek, resemble the Mosaic Laws of the Old Testament Hebrews and are still in force. The head of a family is all-powerful. Houses are built like fortresses with narrow slits for windows and up to 60 persons occupy a single room. Dinaric racial traits have been preserved, so that Albanians are among the tallest people on earth. The most important racial and cultural boundary lies along the Skumbi (Shkumbi) River, a small stream that rises near Lake Ohrid (Ochrida) and enters the Adriatic after flowing past Peqin (Peqinj). To the north are the purest Dinarics averaging approximately six feet in height. These tribal highlanders, Ghegs, have resisted outsiders most effectively. In contrast, to the south are the Tosks on better land organized along feudalistic lines; they are a mixed

people as a result of commercial interests and outside contacts. Toward the coast are Italians, who have generally controlled the Adriatic shore because the Strait of Otranto opposite the heel of the Italian Peninsula is less than 50 miles wide and is a bottleneck to the Adriatic. The traditional Albanians are wholly uninterested in the coast or its strategic value. Outsiders are now realizing the value of this coast.

Albania, 10,629 square miles, proclaimed its independence in 1912, an act recognized by other nations in 1913, and made a German prince its ruler in 1914. It soon fell into a state of disorder and became an Italian protectorate in 1917. It became a republic in 1925 and a kingdom in 1928. Occupied by Greeks, Germans, and Italians during World War II, it was annexed to Italy in 1939, freed in 1944, and proclaimed a republic in 1946. The Government is now strongly communistic. The native name of Albania is Shqipënia and the people know themselves as Shqipëtarë, or rock men. Most of them are quite uninterested in political events.

Only 8 per cent of Albania is arable land, but it supports the densest agricultural population in the Balkans, and one of the densest in Europe, running in some districts to about 1,000 per square mile. Fields are separated by brush fences. Mediterranean products raised toward the coast include olives, lemons, tobacco, and wine grapes, with rice on malarial flats. A surplus of wheat is exported to Dalmatia. Goats are the main domestic animal, and some cheese is exported to the United States. Italians have exported olive oil and wine. They have also developed copper mines near Shkoder (Scutari), as well as a little iron, chromium, asphaltum, and petroleum. The oil province is in the south. The Albanians themselves are little interested in trade. They plant crops for themselves and fish and hunt for food rather than produce for markets.

Roman tourists made use of the baths at Elbasan, which could attract many visitors today if the place were not so difficult to reach. There are few true roads in Albania other than a crude network that leads from the seaport of Durrës (Durazzo) to Tiranë (Tirana), and from there to Korçë (Koritza), 23,000, the industrial city of the southeast, where a railroad is projected into Greece. Durrës, the main seaport, is situated in malarial country and has a poor harbor. It might serve as a Balkan outlet if provided with better communications, as could Vlorë (Valona) to the south. Tiranë (Tirana), the capital, is a central town built during the days of Turkish domination. It has a few modern buildings. Shkoder, in the Drin Valley to the north, could be a natural

outlet for southern Serbia if roads and railroads were developed. The main routes in Albania are mule trails. Commercial development of the interior has hardly begun, and few tourists have penetrated the Alpine landscapes of the interior where some peaks rise above 8,500 feet.

About half of all Albanians live outside of their country. Some overlap into northern Greece, but a great many more are in Serbia. It would be hard to extend Albanian territory, however, without including a majority of non-Albanians, except in the northeast around Djakovica.

EUROPEAN TURKEY

Turks left the steppes of Asia somewhat earlier than the Mongols. Their route led south instead of westward, and their early conquests were centered in southwestern Asia. From subject Arabs they adopted Mohammedanism and became one of its chief advocates when their route of conquest turned across Asia Minor in the eleventh century, and as they proceeded as Ottoman Turks into Europe. Crossing the Dardanelles, they conquered Macedonia, Serbia, and Bulgaria. Constantinople fell in 1453 and all of the Balkans by 1566. The limit in territorial gains was reached at the gates of Vienna in 1683, since which date the Ottoman Empire, step by step, has been forced out of Europe to the small limits set by the Treaty of Lausanne in 1923. The area remaining in Europe is 10,880 square miles, which is less than 4 per cent of the existing republic. The population of European Turkey is about 2 million, which is somewhat over 9 per cent that of the entire



Ottoman Empire, 1815

country. The main reason why any Turkish territory remains in Europe was jealousy between Britain, France, Germany, Italy, Austria-Hungary, and Russia. The narrow gates of the Black Sea have been left in the hands of a weak power, rather than trusted to Russia or the Soviet Union.

Not many Turks settled in lands occupied during their European conquests. A few were needed as rulers of captured territory and some engaged in Moslem missionary activities, but no great displacements in population occurred when Slavs or Magyars returned to power as Turkey declined. The Turk has always tried to avoid residence in a Christian land. Great difficulties arose after 1913, however, when Greece came into possession of Macedonia. This territory was an exception to general rules in that it had become rather densely populated by Turks. In 1914 it is estimated that a quarter of a million Turks went east into Turkey and that a like number of Greeks crossed from the Turkish to the Greek side of the border in Thrace. By 1925 over a million Greeks were returned from Turkey in Asia and some 356,000 Turks were returned from Greece to Turkey. There are still many Turks in Greek Thrace and a colony of some 110,000 Greeks in Istanbul. There is also a small Turkish minority in Bulgaria.

Within recent years Turkey has undergone a number of reforms that have removed it far from Mohammedan orthodoxy. The Latin alphabet has

replaced the Arabic. Sunday is now the weekly day of rest, instead of the Moslem Friday. Civil law has replaced the Holy Law of the Koran. Women have given up their veils and old habits of seclusion. Everyone was required to adopt a family name. Agricultural practices have been reformed. In general, Turkey has made important strides away from Dry World ways of living toward those of the European World.

About two thirds of the rainfall in European Turkey comes in winter and landscapes resemble those of Mediterranean countries. Though frost and snow occur at times, palms and figs survive the mild winters. Sheep, goats, and cattle are abundant. Wheat, sugar beets, sesame, vegetables, grapes, and fruits are common crops. Brush fences outline fields. Thatched roofs cover houses and other buildings in villages. Railroads wind around towns because of prejudice, as in Bulgaria. Stations commonly lie a mile from the outskirts of communities.

The Bosphorus and Dardanelles were valleys leading from the Black Sea during the Ice Age. With the melting of continental ice and rise of sea level they were drowned. The outflow along these narrow channels now takes the form of a rather fast current. Their scenic shores are sorely in need of adequate resort hotels with modern sanitation.

Byzas founded the Greek trading post of Byzantium in 657 B.C. In A.D. 330, Constantine fortified it as protection against the Goths and for the military defense of the lower Danube. As Con-

Table 13 Summary, Shatter Belt peoples, religions, and languages

<i>State</i>	<i>Dominant People</i>	<i>Dominant Language</i>	<i>Dominant Language Family¹</i>	<i>Dominant Religion</i>
Finland	Lapp	Lappish	II Finno-Ugrian	Protestant
	Finn	Finnish	II Finno-Ugrian	Protestant
Estonian SSR	Esth	Estonian	II Finno-Ugrian	Protestant
	Livonian	Livonian	II Finno-Ugrian	Protestant
Latvian SSR	Lett	Lettish	I Baltic	Protestant
Lithuanian SSR	Lithuanian	Lithuanian	I Baltic	Roman Catholic
Poland	Pole	Polish	I West Slavic	Roman Catholic
Czechoslovakia	Czech	Czech	I West Slavic	Roman Catholic
	Moravian	Moravian	I West Slavic	Roman Catholic
	Slovak	Slovakian	I West Slavic	Roman Catholic
Austria	Austrian	German	I Germanic	Roman Catholic
Hungary	Magyar	Magyar	II Finno-Ugrian	Roman Catholic
Rumania	Ruman	Rumanian	I Romanic	Greek Catholic
Bulgaria	Bulgar	Bulgarian	I East Slavic	Greek Catholic
Yugoslavia	Serb	Serbian	I East Slavic	Greek Catholic
	Croat	Croatian	I East Slavic	Roman Catholic
	Bosnian	Serbian	I East Slavic	Mohammedan
	Slovene	Slovenian	I East Slavic	Roman Catholic
Turkey	Turk	Turkish	II Turkish-Tataric	Mohammedan
Albania	Albanian	Albanian	I Thracio-Illyrian	Mohammedan
Greek Macedonia	Mixed	Greek, Serbian	I Hellenic-E. Slav.	Greek Catholic

¹ I, Indo-European, II, Ural-Altaic.

stantinople it commanded trade routes to the Levantine coast. During the fifth and sixth centuries it withstood Barbarian invasions from the north, and, strangely enough, it saved Europe from Mohammedanism in the seventh century. During the European Dark Ages it kept alive learning, the arts of peace, and the science of war. In the eleventh century Constantinople served as the base of a Crusade against the Turks. Its main glory faded in 1204 when Venetians sacked and destroyed it during the Fourth Crusade. Until then it had long been Europe's wealthiest and most powerful city. Italian merchants were probably as much interested in destroying a commercial rival as in any religious endeavors. In 1453 the city fell to the Turks, who have held it ever since, changing its name recently to Istanbul.

Istanbul The immediate site of Istanbul, 0.9 million, lies on seven hills, like many other cities, but has natural protection such as few possessed prior to days of modern warfare. Marshes and open water assisted in its defense. The Golden Horn was not named from color effects but from

the immense profits that are derived from catching mackerel and tunny when they leave the Black Sea in the fall. The location of the city is one of the best in the world—on the crossroads between Black and Aegean traffic, north-south, and that between Europe and Asia, east-west. Here, since ancient times, roads from China, Persia, Mesopotamia, and the Levant have converged to fill trade bazars with spices, fruits, seeds, woods, gems, minerals, and silk. For payment went grain, dried fruit, and other Mediterranean products.

With displacement of the capital to Anatolian Ankara, Istanbul has become a living museum. Its educational, political, and financial interests have been transferred to the new capital. There is some industry, but it is primitive and puny by western standards. As a Shatter Belt outpost, it is "too near Europe and too close to the borders of Turkey" to merit a program of serious development by the Turks, who have concentrated their energies in Asia Minor.

22: Introduction: Greece

The Mediterranean Sea has a length equivalent to the width of the United States between California and South Carolina, and lies in latitudes equivalent to those between New Orleans and Ottawa. The European east-west mountain barrier presses its northern side closely, effectively isolating three major peninsulas: Greek, Italian, and Iberian. These constitute the Mediterranean Realm of the European World.

DISTINGUISHING FEATURES

Industry is distinctly subordinate to agriculture in the Mediterranean Realm. In part this is due to deficiencies in coal and fuel supplies, but it is also a matter of custom and tradition. Horticulture, where the emphasis is on the care of individual plants, predominates over field agriculture, where crops are planted and cultivated en masse. Irrigation and terracing are common practices. Dry farming, with fields lying fallow a good share of the time, occurs on marginal lands. Winter is the season of tillage. Harvests are gathered in spring and early summer. Late summer and fall are seasons of inactivity. Sun-dried fruit is an important commodity, resulting not only from an abundance of orchards but also from a dependable season of drought. The potato occupies a rather minor place in agriculture. Wheat and livestock raising are common occupations. Commercial interests center on maritime activities, and the most important communications cross bodies of water, rather than land.

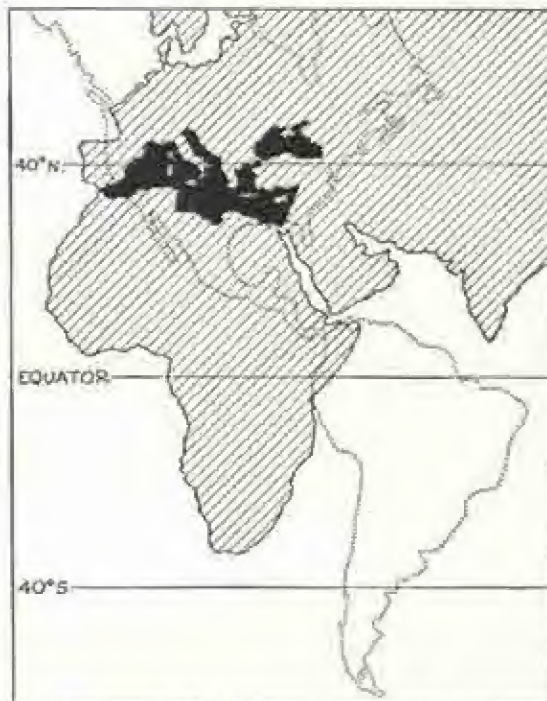
Barley was an ancient cereal of the Mediterranean. It was used to make sacrificial bread and is more commonly associated with religious rites than any other grain. During the days of ancient Greece its market value was as little as one third that of wheat, which was considered a luxury, so that wheat bread was regarded as dessert. Panic (millet), wheat, and sesame also were cultivated at early dates. Rice was introduced by the Saracens (Moslems from Syria and Arabia) in the seventh century.

Olives, figs, pears, and apples are ancient Mediterranean fruits. Phoenicians introduced apricots,

cherries, peaches, plums, and pomegranates from Asia. Alexander the Great brought the citron. Saracens contributed lemons and oranges. The almond found its way from Persia to Egypt, thence to Rhodes, Greece, and Rome.

Wine is the drink of the Mediterranean. Its invention has been ascribed to Osiris by Egyptians, Dionysus by Greeks, Noah by the Israelites, and Bacchus by the Romans. The use of olive oil instead of butterfat dates back to at least 2000 B.C.

There is a general absence of wide agricultural plains in the Mediterranean Realm. Small valley flats are used for growing grain, the best lands going to wheat, artichokes, onions, garlic, cabbages, and flax. Legumes appear on poor soils. Wet flats are used for summer pastures, hay, asparagus, or willows. The latter are extremely useful in lands short of timber for fuel, baskets, and wagon bodies. The best hill lands are used for fruit



Mediterranean Realm: comparative position

orchards, figs, and grapes, while the poorer support olives. Mountains are sources of timber, or they serve as summer pasture.

There is considerable commerce between varying altitudes. Grain lands are low. Figs, fruits, and olives reach up to about 2,000 feet, vineyards to 3,500, barley to 5,000, and hogs and timber to 6,000. Sheep and goats cross all zones. A characteristic of Mediterranean landscapes is provision for transhumance in the form of definite, broad sheep drives—roadless highways leading from winter lowlands to high summer pastures wide enough to permit grazing en route. These *calles publicas* of the Romans are the *tratturi* of today.

Summer drought and the possibility of delay in the arrival of the rainy season made weather gods supreme among deities. Zeus, Baal, Jehovah, and Jupiter (*Pluvius*, *rainy*) demanded temples on mountains, where precipitation was heaviest, at sources of water supplies. Saint Elias, in a similar role is the ruin giver of Greek Catholicism. The drought lasts for seven months at Alexandria, four months in Sicily and Greece, two months at Istanbul, and is confined to the month of July in southernmost France. Practically all wars in ancient Mediterranean lands were fought during summer, when the ground was hard and dependable. The American invasions of northern Africa and Sicily in World War II defied tradition, with the result that campaigns were bogged down in mud and hindered by torrential streams. Summer dryness brought the practice of irrigation from Levantine lands into Greece prior to 1000 B.C. It also led to the construction of aqueducts wherever cities demanded water beyond quantities available locally. They were numerous in Asia Minor and in all Mediterranean lands under Roman control. The great Appian aqueduct was constructed in 313 B.C.

Sharp contrasts in stream flow between wet and dry seasons, even to the extent of exposure of completely dry beds for several summer months along courses where torrents rage in winter, render typical Mediterranean streams of little use for navigation or hydroelectric development. Logs can be rafted only during the wet season but even then with less certainty of reaching their destination than they would have along northwestern European streams having comparatively uniform stages. Streams fail when water is most necessary for agriculture, or when grazing animals could satisfy thirst along small upland tributaries. Every Mediterranean tongue has a term

for the type of stream that goes dry, or practically so in summer. The *wadies* of northern Africa are the equivalents of the *ramblas* of Spain, *fiumares* of Italy, or the *arroyos* and *washes* of the southwestern United States.

Steep slopes, small valleys insufficiently forested, and soil-protected slopes, combine with seasonal flow to make Mediterranean streams carry large loads of debris. During flood they are muddy and may carry gravel, or even large boulders. Where gradients break they spread *alluvial fans* over plains or deltas into bodies of standing water. Towns avoid sites where floods or alluvial deposits threaten their stability. Ports are not located along streams, but lie off to the side, where they may serve a valley and at the same time avoid the delta and disadvantages of shifting, shoaling channels. Mediterranean ports are almost always on the left side of the valleys they serve. Alexandria lies to the west of the Nile Delta, Venice is well north of the Po, Salonika east of the Vardar, Napoli (Naples) south of the Volturno, Livorno (Leghorn) south of the Arno, Marseille east of the Rhone, and Cadiz east of the Guadalquivir. Tarragona, a rather poor harbor but important outlet for the Ebro Valley, also lies to the left of the river but at considerable distance. The Romans connected it by road to the valley over a pass 3,320 feet high.

Rough topography, treacherous streams, and limited flats for agriculture or dense populations render overland communication difficult, so that peoples with sharply different culture traits commonly live within short airline distances. Tideless seas, high coasts, numerous islands, and commercial opportunities attract Mediterranean peoples to the sea. Navigation dates back at least to 3000 B.C. Maritime city-states arose at early dates in Crete, Phoenicia, Greece, Carthage, and Tuscany. Later they developed in Venice, Genoa, Pisa, Barcelona, and other places. Early navigators never left the sight of land voluntarily. They would sail out from shore in the morning with the land breeze, and back again in the evening with the sea breeze. Ports were favored where good landmarks existed, and temples rose on promontory hills. Low coasts were feared and avoided, particularly in front of deltas where, in addition to absence of trustworthy landmarks, there was the hazard of shoal water. The first lighthouse in the world was erected in Alexandria to overcome in part the disadvantage of location on a low coast some 500 miles long.

The Phoenicians were particularly skilled as navigators. They had no desire for empire, but were interested in establishing a maritime league of friendly ports. As early as 480 B.C. they were

able to furnish a friendly ruler, Xerxes, with 300 triremes. Their activities were limited by cold waters on the north and the Sahara to the south. We should not lose sight of the fact, however, that other great seafaring peoples were their contemporaries, especially in the Far East. Indian and Chinese ships made regular runs to the head of the Persian Gulf loaded with textiles and ceramic wares far superior to any made in Europe. This trade was eventually taken over by both Phoenicians and Greeks. Under orders from Alexander the Great, Nearchus made the trip from India to the Euphrates in 325 B.C. Greek commercial agents were numerous in Ceylon and India by the beginning of the Christian Era. Traders, such as Diogenes, made many trips to India and this particular adventurer is known to have gone well down the east coast of Africa during the first century; but Phoenicians had circumnavigated the African continent some five centuries earlier.

Maritime commerce always encourages piracy. Persians preyed on Indian-Levantine trade so heavily that the Greeks in the first century A.D. started using a route across the Red Sea and Indian Ocean. This way to India had the advantage of steady monsoon winds which blew seasonally toward Asia in summer and away from it in winter. The added security of the new route stimulated trade, so that many Roman coins began appearing in China shortly after A.D. 100.

Mediterranean pirates did not confine their activities to the sea but were likely to raid seaports or towns along the coast. In ancient times this danger forced many settlements a few miles inland. The Phoenicians found trade more profitable than piracy, but when commerce was dull, they readily turned to the practice. During the Middle Ages, Vandal, Dalmatian, and Saracen pirates were so numerous that many Mediterranean coastal lands were practically depopulated.

Commerce grew to importance in the Mediterranean after the rise of ancient city-states. Wheat, barley, olives, and figs were produced everywhere, so there was little need for interchange between separated areas. When dense urban populations arose, however, it became necessary to transfer other commodities from places that could produce them to centers of consumption. Shipments of wool, camel's hair, and timber began crossing the Aegean in considerable quantities by the eighth century B.C.

The Mediterranean witnessed an ancient urbanization that was unknown in other parts of Europe. By 431 B.C. Athens had a population of 100,000 free citizens, 30,000 foreigners, and 100,000 slaves. Carthage was large and prosperous in 500 B.C. and in 146 B.C. had a population esti-

mated as being at least 700,000, and possibly 1 million. Rome had a population of 1 million at the start of the Christian Era. The problems of supplying food, clothing, water, sanitation, other essentials, and luxuries to cities of that size are not simple. Without railroads, engines, steam power, electricity, heavy iron and steel structures, and hundreds of items we consider commonplace, such as neighborhood groceries, smallpox vaccine, or pasteurized milk, it is amazing that such metropolises could have existed at all. Grain had to come from the northern shores of the Black Sea, lumber from the Caucasus and other places, linen from Egypt, silk from China, coarse cloth from France, metals from many distant places, fur from Russia, and so on. Luxury items were important in ancient trade. Amber and ermine were reaching the Mediterranean long before written history began. Flax came from Mesopotamia in 3000 B.C. The first silk arrived from China in about 500 B.C. Aesthetic tastes sent ships to the African coast for saffron, for yellow dye; to India for indigo to produce blue colors in textiles and ceramics; to the Levantine and African coasts for the snail, *Murex*, for red and purple dyes; and to the interior of Spain for many vegetable-dye materials.

Forests, as a result of this urbanization, are now confined largely to places that are inaccessible. They disappeared first along streams where rafting was easiest, especially those leading toward city-states. The heaviest inroads were in the eastern Mediterranean in the very area where deficiency in precipitation made it least likely that trees could be replaced. In Iberia there are still extensive forests, very largely for the reason that it was a remote region in antiquity where there was little commerce in timber. In Greece, on the other hand, there is very little forest left. Deforestation was so serious in antiquity that Athens prohibited export of timber, pitch, and resin. Early Roman architects had to omit heavy beams and design structures that could make use of small timbers, or practically none at all. Nations commanding tall trees could afford to have better boats and greater naval strength. The tall firs of Macedonia were an extremely valuable resource, serving as masts and oars for Greek boats. Most structural timber had to come from the eastern end of the Black Sea. Decay-resistant cedar came from Lebanon and the Atlas ranges. Ebony and teak arrived from India.

Forests supplied not only timber but resin and tar needed for preservation of wood on ships and coating the earthen jars used for storing wine.

Cedar oil was used as antiseptic, for protection from insects, and for embalming Egyptian notables.

Fear of forest is an old Mediterranean characteristic appearing in literature from most ancient times. Unlike the Balt or early Nordic, the Mediterranean felt insecure in an environment of closely spaced trees. Many groves were associated with deities, often becoming sites for protective temples or shrines. The dense forests of the east-west mountain barrier discouraged the early Mediterranean from migrating into other parts of Europe.

Mediterranean forests are particularly aromatic. Dry summers favor the presence of oils and resins in wood and contribute to their dissemination into the atmosphere. Annual drought also increases forest-fire hazard. In California, for example, a tremendous area is normally burned over each year. It is likely that the spread of maquis has been favored a great deal by fire. To the herdsman, as a rule, these fires are fortunate events. He regards the forest as unproductive land. Its restriction extends the area of possible grazing territory. In the brush, fires favor the growth of grass and palatable herbs. If lightning fails, carelessness or incendiarism may increase profits from grazing.

High mountains indicate present-day geological activity. The entire east-west Eurasian mountain barrier is the scene of mountain growth at a rate possibly as rapid today as at any time in the past. Volcanoes along the trend pour out molten materials that solidify as lava or explosively blow fragments into the air. Earthquakes often accompany such activity, though most shocks are caused by displacements along faults. Not only the wall but most of Jericho has fallen when tremors accompanied a deepening of the Jordan Valley graben; in fact, they have fallen so many times that finally people gave up any attempt of restoration. Populated islands have sunk into the Aegean. Spartan soldiers have been unnerved in battle. To mention a few great Mediterranean earthquake disasters: in the year 856, 45,000 persons lost their lives at Corinth in Greece; in 1693, 60,000 at Catania, Italy; in 1755, 60,000 at Lisbon, Portugal; in 1783, 50,000 in Calabria, Italy; in 1822, 22,000 at Aleppo (Alep, Haleb), Syria; in 1908, 75,000 at Messina, Italy; and in 1915, 39,000 at Avezzano, Italy. There is little wonder that cataclysmic cults have arisen among Mediterranean peoples, that their mythologies and religions include stories of almost complete destructions of large populations as the result of deluge

or the wrath of some deity. There are compensating advantages associated with crustal unrest. The fertility of many volcanic soils was thoroughly recognized by Strabo, a Greek geographer who lived at the beginning of the Christian Era.

There is remarkable unity in Mediterranean lands. *Orbis terrarum, acumenens*, was isolated by a mountain barrier to the north and by seas or deserts on other sides. It was difficult for invaders to reach and rather hard for its inhabitants to leave. The climate was so distinctive that it demanded culture traits quite unlike those of other regions. Though heavily indebted to outside peoples for material and spiritual contributions, the civilization that developed in the Mediterranean Basin kept aloof in many ways from those elsewhere. The Mediterranean race has maintained its characteristics at home about as tenaciously as any people in the world.

CLASSICAL CULTURE

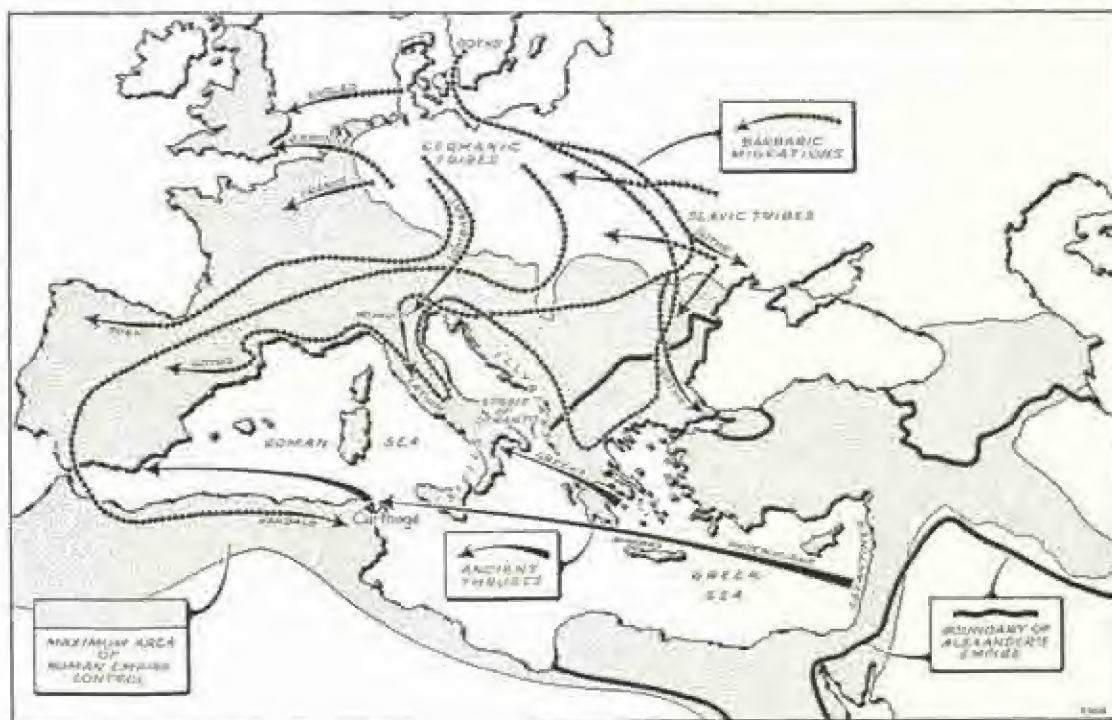
In tracing the origins of our civilization, we find most paths leading back to the Mediterranean and from thence eastward to Mesopotamia and India. Toward the start of the Mediterranean phase we encounter the Minoan civilization of Crete. From Cnossus (Knossos, Gnosus) went some of the earliest European seafarers, possibly before 3000 B.C., to Egypt where they sold the finest pottery known to the ancients, to Greece where they found barbarians, and, by some such date as 2000 B.C., to the western Mediterranean for tin necessary for making the bronze that was to revolutionize cultures sufficiently to mark the beginning of a new Age in the history of man locally. By 1200 B.C. the Minoans had found people in Sicily advanced enough to carry on trade.

From Crete the course of civilization led northward into Greece. By some such date as 1000 B.C. the Minoan star had set, some believe as the result of earthquakes; others attribute the decline to the Greeks, who begin to appear on the scene in about 1200 B.C. as aggressors. The classical elements in our civilization developed mainly in Greece and at a particularly rapid rate during the last five centuries before the start of the Christian Era. The great spread of classical culture occurred during the Pax Romana, a period of peace enforced by the overwhelming power of Rome that lasted from 31 B.C. to A.D. 378.

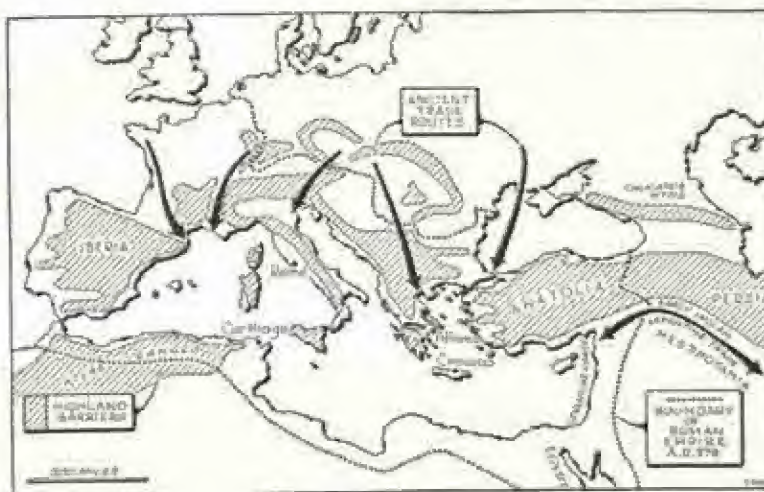
There are five main routes between the Mediterranean and northern Europe: (1) Black Sea, via the Bosphorus, (2) Vardar-Morava, (3) Eastern Alpine, across Slovenia and passes as far west as Brenner, (4) Rhone Corridor, and (5) Gate of Carcassonne. For many centuries raw materials

had come south and finished products gone north along these routes in commerce between the advanced Mediterraneans and the backward inhabitants of other parts of Europe. The end of the classical period and advent of Europe's Dark Ages came when the Romans were no longer strong enough to enforce Pax Romana and control the routes out of the Mediterranean Basin. The Germanic barriers had been weakening for a long period but suddenly failed completely with the appearance of Goths in A.D. 378.

The traditions of classical culture were preserved by peoples in the East, by Arabians, Levantines, and at Constantinople. They were also preserved by monks and other isolated groups in the Mediterranean region itself. They were to a considerable degree absorbed by the Germanic invaders and retained by northwestern Europeans who had come into earlier contact with the Romans.



Mediterranean Realm:
ancient empires and thrusts



Mediterranean Realm: highland
barriers and ancient trade routes

GREECE

Hellenic-speaking people, who were either Nordics or at least resembled that racial stock closely, came south along the Morava-Vardar route in considerable numbers during the thirteenth to tenth centuries B.C. Many settled in the Grecian Peninsula, others spread out over Aegean Islands and along the western coast of Anatolia. The fair-skinned invaders found these lands inhabited by dark Mediterraneans who were culturally their superiors according to the standards of European civilization because they had been in more or less contact with Minoans and to some degree had absorbed culture traits from Mesopotamia, the Levant, and Egypt. The Hellenes blended with the Mediterraneans, adopted their ways, and developed the most brilliant scholarship and culture of the eastern Mediterranean by the fifth century B.C.

In 146 B.C. Greece became a province of the Roman Empire. Toward the start of the Dark Ages it became part of the Byzantine Empire. Its Christianity developed along Eastern lines.

In the eleventh century the Greek Orthodox Church severed connection with Roman Catholicism. This schism was later to have great effect on European cultures and therefore is a matter of geographical interest. Christianity advanced north from the Mediterranean to the rest of Europe in two main forms: (1) the Roman Church, which spread west, north, and northeast as far as the Baltic States; and (2) the Greek Church, which, as we have seen, was inherited by Moscow when it became the "Third Rome," and which

spread generally among Slavic-speaking people, excepting the North or West Slavs who generally adopted the religion of western Europeans. The Shatter Belt might be quite a different territory today had not disputes arisen over such questions as whether statues or icons should be used in churches, whether services should be conducted in Latin, or whether the authority of the pope of Rome should be greater than that of the Byzantine patriarch.

CULTURAL LANDSCAPES

The Grecian Peninsula, between the Ionian and Aegean seas, is the easternmost of the three great projections of European lands into the southern sea.

The highlands of Albania extend southward as the Pindus Mountains. Here some Greeks live over 50 miles from salt water; no others are so far inland. This high territory is far more barren than its annual precipitation might suggest. Ionina (Yannina) on the west slope receives 50 inches, and places higher up are even more adequately watered, but limestone is the most common rock and water finds its way down into crevices soon after reaching the surface, leaving little for plants. In the highlands of Epirus and Thessaly population density is under 50 per square mile, as compared with over 450 for Greece as a whole. Little stone huts provide common shelter for families and their flocks in these highlands. Life is pastoral. The people, culturally and physically, are rather strongly Slavized and Alpine, but like practically all other Greeks, are strongly orthodox in religion. In the interior, many speak Vlach, a Romanic language.

To the south of the Pindus is the Peloponnesos (Morea), a rough, partially drowned continuation of the highlands of Epirus that just barely escape being an island. It was severed by the Corinthian Canal between the Gulfs of Aegina (Saronic Gulf) and Corinth. The population is strongly Mediterranean in stock and culture, turning mainly to seafaring, trade, and market gardening. The amount of agricultural land is small but intensively used. Here arose many of the city-states of ancient times, in small valleys such as that surrounding Sparta in the south. To the west and extending up the coast of Epirus are the Ionian Islands—stepping stones toward southern Italy.

Thessaly lies to the east of the Pindus Mountains. Its more important parts are lowlands between ridges extending southeastward. The southernmost ridges project across Attica to the Cyclades Islands. Farther north are the Othrys



Greece: physical divisions

mountains, which trend eastward from the Pindus to the large island of Euboea, and others that mark the trend of a range of hills now largely submerged. Here are stepping stones to Asia Minor. The Northern Sporades and the Sporades form another eastward link not far to the north. There are so many islands in the Aegean that no water lies over 40 miles from some coast.

The Plains of Thessaly are not as typically Mediterranean in culture as are the islands and lowlands to the south. The temperatures are similar in summer, with the mercury reading from 75° to 80° F. during July, but January is cooler, 45° to 50°, and at times extremely cold blasts of wind sweep down from the north. Comparatively large areas in the lowland are undeveloped because their inhabitants are unable to carry on typical Mediterranean agriculture.

Macedonia, a strip averaging about fifty miles wide along the southern boundary of Yugoslavia and northern borders of the Adriatic, remained under Turkish control until 1913, whereas territory to the west and south was freed in 1832. It belongs to the Shatter Belt culturally, Bulgar and Serbian being its dominant languages with Greek in minority status. The peoples are mainly Alpine and are generally Slavicized. Farther east, in western Thrace, both Bulgars and Turks are numerous. Greeks are concentrated along the coast, but many have resided there only since 1923 or later.

Of the total area of Greece, 51,246 square miles, which is less than that of Alabama, about 55 per cent is wasteland. About 19 per cent is normally under cultivation, 17 per cent in pasture, and 9 per cent in forest. Less than 20 per cent of Greece is flat enough for annual plowing. Farms are small, so that their typical double-story stone houses lie rather closely together along valleys and on coastal plains. Production levels are not high. About 60 per cent of the population of 7.6 million is engaged in agriculture, most of which is not far above a subsistence basis.

The common cereal crops are supplemented by maize. Oranges, mandarins, lemons, figs, and dates grow in the south. Apples and pears are raised in the uplands. Almonds stand foremost among nut crops. Cotton and tobacco have been introduced with success, the latter being the chief cash crop in Macedonia and Thrace. Olives cover hillsides along the valleys, as do vineyards. In addition to wine grapes is the special currant grape, tiny and practically free from stones. These *raisins de Corinthe* grow mainly along the west coast and crops are ordinarily more than sufficient to supply the world demand. Various control measures have been adopted to limit the supply

so as to maintain adequate return, one of the most successful being that of converting the surplus into alcohol. Many Greek wines have attained excellent reputation abroad.

The dependence of Greece on such luxury products as wine, currants, and "Turkish" tobacco for income derived from exports places the economy of the country in jeopardy in time of war or financial depression elsewhere. Greeks ordinarily starve or suffer extreme hardship because they give too little land to food production. World Wars I and II have both been extremely hard on the country. During the winter of 1941, the death rate from starvation in Athens amounted to 400 per day. Grain and other foods always rank high among imports. In ordinary times the people of Kavalla, Drama, and Xanthi prosper from the sale of tobacco, but it is inedible and starvation is acute when they are unable to sell it.

Greece has little fuel other than lignite and not much mineral wealth. Iron, lead, and zinc deposits occur in various places, as well as small amounts of copper, nickel, and manganese. Considerable emery is produced from the island of Naxos, and salt, at various places. There is little basis for metal industry except on a very small scale.

Most industry is concentrated on agricultural processing. Wine, raisins, currants, olive oil, and tobacco are the main exports. Flour mills are numerous and there are small textile and leather industries. Cheese and soap making are fairly active.

The balance of trade is usually strongly unfavorable. Imports exceed the value of exports by a rather wide margin. In order to keep solvent it is necessary that Greeks, like Norwegians, engage in commerce and go to sea. There is generally an important tourist income, because peo-



Greece: index map

ples from all European lands are attracted to the many antiquities that remain in various parts of Greece. Emigrants have been accustomed to sending important sums of money to relatives in the home country, and many follow a general desire to return to Athens or some other part of the motherland upon retirement. These repatriates bring important sums of money earned in foreign countries.

There is a general belief that Greece has long been overpopulated. From the seventh century B.C. to A.D. 1453, its inhabitants went to Russia and the Caucasus for timber, to Russia and Crimea for wheat and hides, exchanging wine and other Mediterranean products for such imports. Many took to sea as fishermen and traders. Others began colonizing lands beyond the Aegean Islands as early as the eighth century B.C. Within recent times such facts as unfavorable trade balance and famines have been cited to support the population pressure idea, but one school of thought believes that overpopulation is not particularly serious. The density of population is not nearly so great as that of Italy. Much land remains comparatively idle that would be used by other peoples. The unfavorable economic status has been attributed to poor farming and general refusal to cultivate more useful crops. The urge toward emigration may be simply an ancient culture trait. Greeks have been adventurers and seekers of fortunes in other lands for twenty-five or more centuries, starting long before population was dense.

Athens (Athenai), 0.56 million, with its port, Piraeus (Peiraeus), 0.19, is the only modern city and important population knot in Greece. Below

its ancient Acropolis and other classical monuments lies a city with considerable commerce but only minor industry, concentrated on textiles and leather goods. Repatriates from Asia Minor have established a carpet and rug industry that may develop significantly. Piraeus manufactures cotton goods. Salonika (Thessalonike), 0.24 million, carries on a little manufacturing but is of greatest consequence as the Vardar Valley outlet. It has long been the most important Serbian seaport and in 1923 the Greeks ceded to the Yugoslavs a free zone for 50 years. Levadeia, northwest of Athens, and Trikhala, on the plains of Thessaly, spin home-grown cotton. Patras (Patrai), west of the Gulf of Corinth, is the main currant export center.

Mount Athos, on an arm of the Khalkidike Peninsula, southeast of Salonika, is an autonomous republic, and spiritual center of the Orthodox Church. On 2 square miles are 20 monasteries in which some 5,000 monks and clerics live. Until 1946, when members of the Women's Army Corps ended the tradition, no females had ever penetrated its sanctity.

As late as 1900, Smyrna had a larger Greek population than Athens, some 400,000, and with the district immediately surrounding it, over 1 million. These were moved en masse, mainly to Thrace. The Dodecanese Islands were occupied by Italy in 1912, in spite of the fact that they have been populated by Greeks for thirty centuries or so. The population is about 80,000, and lives by agriculture and sponge fishing. The main importance of this island group, however, is strategic, as it controls the southeastern outlet of the Aegean between Crete and Anatolia. The Dodecanese were returned to Greece in 1947.

23: Italy

Before the days of the Romans Italy was occupied by small population groups who were settled in villages. The preferred location was a hill where refuge might be found within the walls of a *capitulum*, or communal fort. The tradition of hill towns and villages has lasted to the present day. After malaria was introduced from Africa, high locations were particularly advantageous because they were fairly free from mosquitoes.

The original inhabitants were typically Mediterranean in race. A group known as Sicils, who were spread not only over the island of Sicily but also widely in the southern part of the peninsula, were first to experience commercial contacts with eastern Mediterraneans. Minoans and Levantines established trade in about the twelfth century B.C., and colonized the country to some extent during the next four or five centuries. Illyrians, who were probably far more Mediterranean than Dinaric at the time, were astride the Strait of Otranto in 724 B.C. when the first Greeks appeared as colonizers in southern Italy. Greek colonization spread widely over the lands of the Sicils. Rome was founded a few years after the Greeks arrived. Its power grew rather rapidly. By 264 B.C.,

Romans were involved in the First Punic War, the first of three with Carthage which ended with the burning of that city in 146 B.C. By 229 B.C. the Romans established a protectorate over the Illyrian coasts of the Adriatic and were in control of Otranto.

Inspired by Greek culture, the people of Latium developed a genius for military and governmental organization which culminated in the greatness of Rome, the ability to enforce Pax Romana, and therefore in establishing Mediterranean civilization widely in lands between the east-west mountain barrier and the desert, as well as bringing many of its advantages to peoples as far north as the Danube and east to the Rhine. When the cult of materialism so weakened the power of Rome that it could no longer hold against Germanic invasions, new peoples appeared from across the Alps, and the Mediterranean racial stock of Italy lost much of its purity. Lombards and other northern peoples introduced strong Nordic elements, particularly in the Po Valley, where people with Nordic racial traits are by no means uncommon today. During the Middle Ages many Alpines spread southward, particularly into lands north



Eastern and Western Empires; Italy: index map

of the Apennines. Even the population of Sicily became badly mixed with Mediterranean elements from the Levant, Greeks, and Nordics.

PHYSICAL BACKGROUND

Italy lies centrally in the Mediterranean. To the east is the Greek Sea with an area of 1.65 million square miles, and to the south and west, the Roman Sea with an area of 0.328 million square miles. The eastern sea extends northwest to the head of the Adriatic, southwest to the Gulf of Gabes (Little Sirte), southeast to the southern end of the Levantine Sea, and northeast to the Caucasus at the corner of the Black Sea. Greece itself is

rather central in this group of irregular seas with their many islands. The Roman Sea extends east to the Tyrrhenian Sea, a triangle bounded by Italy, Sicily, and Sardinia-Corsica. It reaches west to the Strait of Gibraltar and north to the Gulf of Lions and the Ligurian Sea.

Between the Greek and Roman seas is a double "land bridge" from the "toe" of Italy to Sicily and from thence either to Cape Bon on the African coast by way of Pantelleria, or by way of Malta and Lampedusa to Cape bou Dia in eastern Tunisia. Cape Bon is commonly visible from Sicily, 85 miles away. The trip from Leghorn (Livorno) along the coasts of Corsica and Sardinia to Africa may be made without losing sight of land. There is little wonder why Rome annexed Carthage in 146 B.C., and why Julius Caesar re-



built the city. It was much more accessible to the Romans than the Po Valley.

Italy, 116,2 thousand square miles, is somewhat smaller than New Mexico but it is diverse. Topographic barriers stand in the way of free communications. Prior to Roman times it had been divided into many parts politically, and since then it has ordinarily been the habitat of many nationalities. The present state dates only from 1861 when the first Italian Parliament met, and the state assumed more or less its existing form in 1870 when Rome and other Papal States were added to the nation. Political unity, however, has done little to reduce cultural contrasts among peoples in its various parts.

The Maritime Alps extend along the Ligurian coast west of Collo dell' Altare, above Savona. Alps continue northward along the French border, culminating in Mont Blanc, 15,781 feet, the highest European peak west of the Caucasus. The Swiss Alps separate Italy from Switzerland. To the east are the Rhaetian Alps, Dolomites, and Carnic Alps along the Austrian boundary, and the Julian Alps bordering Slovenia in Yugoslavia. There are few ways of crossing this barrier and none is easy. The coastal route to southern France is narrow and difficult. Mt. Cenis Pass to Lyon, the Little and Great St. Bernard passes to Geneva and Lausanne, Simplon to Bern, and St. Gotthard to Zurich are formidable. Brenner Pass to the upper Danube is by all odds the easiest and most useful in crossing the Alps. Various routes across the eastern ends of the Alpine ranges, including Semmering Pass to Vienna, are expensive and troublesome to use.

The upper end of the Po Valley, or Piedmont (Piemont), is a basin open to the east. Lombardy, in the central Po Valley, extends northward into scenic alpine territory with long, glacially dammed lakes such as Maggiore and Como, a terrain that extends eastward into Trentino with its large Lake of Garda. The lower Po Valley is divided into Emilia on the south, and Venezia on the north. The average January temperature in the Po Valley is about 10° F. lower than that of Rome, approaching freezing on the lowlands. Snow is not uncommon. When the cold *bora* descends with icy blasts from the Alps the mercury may sink well below 32°. The climate is not Mediterranean. Spring and summer are the rainiest seasons.

The Apennines are by no means a symmetrical backbone along peninsular Italy. Though the average width of the "leg" is under 100 miles, and nowhere above 150, there are few good routes between Tyrrhenian and Adriatic coasts. Well over half of the peninsula is hilly or mountainous. Lowlands are isolated almost as effectively as in

Greece. From Savona toward Ancona on the Adriatic the trend of the Apennines is only slightly south of eastward. Between the latitudes of Ancona and Rome they trend slightly east of southward, beyond which they gradually swing to the west coast, in Calabria. The roughness of these mountains is coupled with not inconsiderable heights. They attain 7,103 feet on Monte Cimone in the north, and 9,560 feet on Gran Sasso d'Italia in the central part of the range. South of Rome many summits rise above 6,000 feet.

Tuscany, with lowlands along the Arno and elsewhere, nestles within the northern curve of the Apennines to the east of the Ligurian Sea. Umbria lies to the south in command of upper Tiber (Tevere) Valley routes between coastal hills and the Apennines. Latium spreads along the coast on either side of Rome (Roma). Campania occupies a similar territory with respect to Naples (Napoli). To the east of the main divides is Marche, along a rather narrow coast south of the Po Valley, with Abruzzi and Molise to the south. Apulia extends to the Otranto heel and Calabria to the Sicilian toe. These and other provinces constitute peninsular Italy, and during the past they have been centers of individual nations. The provinces to the north were generally foreign territory—*cisalpine Gaul*—during the days of the Roman republic.

Peninsular Italy is typical Mediterranean territory. The lowlands are only moderately supplied with cool-season rain. Summers are warm or hot, July averaging 76° F. in Rome. The blasts of the hot *sirocco*, a south wind that at times brings dust from the Sahara, are not uncommon in the southern part of the peninsula.

Less than 10 per cent of Italy is actual wasteland, but a great deal of barren land with poor soils is present. About 75 per cent is used by agriculture and as grazing land. Less than 16 per cent is in forest, mainly in the Alps. It was necessary for Rome to turn to the Caucasus and Atlas mountains for timber at the time of Christ. Water supply for irrigation was so limited that the term *rivales*, which meant nothing more than those people who drew from the same source, has come to mean competitors, in the form *rivals*.

CULTURAL LANDSCAPES

ALPINE ITALY Alpine Italy extends up beyond the timber line into territory as scenic as any in Europe, with active glaciers, ice-scoured lake basins, steep cliffs, and magnificent waterfalls. Tiro-

lean landscapes occur toward Brenner Pass, where the culture is Germanic. Many French-speaking people live in the upper valleys of various ranges from the Maritime Alps to as far as Simplon Pass. Minor Romanic languages are spoken eastward. Romansh (Reto-Romanic), one of the four official languages of Switzerland, reaches south of the Alps toward the Adige, the Italian stream valley leading to Brenner Pass. Ladinic is the tongue of a few people just east of Brenner Pass, and a zone of Friulian-speaking people separate Italians from Slovenes. Germans have long vacationed in Italian Tirol, mainly in valleys above Bolzano (Bozen), in territory where German was the common school language until its teaching was stopped under Mussolini after 1922.

Alpine streams furnish a large amount of Italy's hydroelectric power, which is about half developed. A pastoral zone lies above a belt of forest, and vineyards at lower elevations furnish both table and wine grapes. The red wine of Adda Valley, above the Lake of Como, has long been famous. Handsome villas and resorts line the shores of the long lakes impounded by morainal dams north of the Po Valley. Olives and mulberry trees cover extensive areas of lower and drier hills. Deposits of iron occur along Dora Baltea north of Turin, and Val Camonica north of Milan. Copper, lead, and iron occur in small amounts toward the east. Idria, near the Slovenian border, furnishes Italy with a large surplus of mercury (quicksilver), the only mineral product other than sulphur (from Sicily) that really is abundant. Lignite is the main mineral fuel of Italy, but some coal exists at Albion in the southeastern part of the Istrian Peninsula, and some petroleum is produced in the Po Valley.

PO VALLEY The Po Valley contains about 20 per cent of the area and supports about 40 per cent of Italy's 47 million people. Its population is mainly Alpine, but Nordic stock is strongly represented, as is Mediterranean. To the Romans it was foreign territory entered when Caesar violated orders, crossed the Rubicon (now Fiumicino, a small stream that enters the Adriatic near Rimini), and precipitated civil war that eventually elevated him to supreme authority. During Holy Roman Empire days the Po Valley played an important part in the political leadership of central Europe. Its great city-states, such as Venezia (Venice), Padova (Padua), Verona, and Milano (Milan), became cultural and commercial leaders for all of Europe toward the end of medieval times. The University of Padua was

founded in 1222. Northern Italy's leadership developed the Italian language and, finally, the unification movement that led to the existing national state.

The Po Valley is Italy's great granary and storehouse. It grows large quantities of wheat and maize, the latter being the basis for polenta, a favorite food of northern Italy. Rice is grown between Milan and Alessandria and near the Adriatic. Its quality is so excellent that few Italians can afford to eat it. This rice commands a high price in the world market so that Italian rice actually goes to the tables of wealthy Orientals and Italy imports less expensive kinds. Hemp, sugar beets, and other crops cover lowlands. Mulberry trees supported silkworms that produced 80 per cent of Italy's silk, but this industry has declined since 1915 because Italian labor is expensive as compared with that of the Far East. Most of the cost of silk lies in the labor of unwinding the fibers from the cocoons.

Mantova (Mantua) is the dividing point between surplus and deficient soil moisture. Downstream it is necessary to ditch and drain lowland flats. This practice creates a peculiar cultural landscape in which extensive areas are divided by ditches into little rectangles that are cultivated in such a way that they rise centrally to give the whole surface a quilted appearance. Trees along ditches form windbreaks. Upstream from Mantova it is necessary to irrigate, so that fields are outlined by ditches that wind irregularly with contours of the land. Villages and towns cluster at high points, which may be actual hills or only small topographic highs along the valley floor.

Toward the base of Alpine slopes, where streams first encounter the reduced gradients of the alluvially filled Po Valley, extensive areas of gravel and sand are useless agriculturally. Here dairying is the main activity and among its products are the famous Gorgonzola and Parmesan cheeses. Extensive marshes lie toward the Adriatic, where malaria is rampant. The Po delta has advanced into the Adriatic at some places. Adria now lies some sixteen miles inland, but in the sixth century B.C. it was a port after which the sea was named. Other parts of the great compound deltaic coast of the Po and Adige (Etsch) have either remained about stationary or actually have been driven landward by wave erosion. Vineyards cover many slopes on either side of the Po Valley, many sandy ridges in delta marshlands, and other dry locations.

Most of Italy's industrial development centers in the Po Valley. There is no true coal, but labor is cheap enough by European standards to permit some import and heavy reliance is placed on

"white coal," or electricity from Alpine streams. Textile manufacturing was stimulated by the presence of native silk and by the passage of a high tariff law in 1887 which led the Swiss to establish cotton mills in the Po Valley. Cotton cloth, 90 per cent of Italy's silk thread and cloth, synthetic silk, hats, automobile tires, and some iron and steel products are the main industrial products.

Venezia (Venice), 0.285 million, was long the commercial capital of the northern Adriatic. Its height of power lasted from 1204 to 1489. Oriental trade through Alexandria gave way to Flemish trade through Gibraltar. The Commercial Revolution found Venice too far removed from the Atlantic to remain important. It is a curious place, surrounded by marshes with buildings on piles facing canals instead of streets. There are a few streets and many paved walks between its densely crowded houses and small factories. An industrial city is developing near the railroad terminus a short distance from the main city and on more solid land. Tourists have been one of the main economic bolsters that have kept Venice from complete decay. The Campanile, St. Mark's, many historic buildings, art galleries, factories engaged in glass spinning, and gondola rides have wide appeal. The main industrial wares are luxury items, such as articles made of glass and lace, but the port is reviving to some extent commercially and such industries as shipbuilding are present.

Verona, about midway between Venezia and Milano, is an important railroad junction on the Adige, the gate to Brenner Pass. To the south, at the base of Apennines' slopes is *Bologna*, 0.320, commanding the best route to Florence (Firenze), Rome (Roma), and other points down the peninsula. This picturesque city became the site of a university in 1200. It carries on such high-priced industries as the manufacture of weapons and objects of art.

Milano (Milan), 1.28, on the northern side of the valley in central Lombardy, is the commercial and industrial leader not only of the Po basin, but of all Italy. It commands the Simplon and St. Gotthard routes, as well as being accessible to the Ligurian coast. As a silk center it surpasses Lyon. Machinery, railroad equipment, electrical goods, and other expensive metal goods are manufactured, as well as locomotives, railway cars, and other products of heavy industry.

Torino (Turin), 0.723, toward the western end of the Po Valley in Piedmont, is served by Mt. Cenis Pass and routes to the Ligurian coast. In Roman times it was the head of Po navigation, some 250 miles from the Adriatic. Its products resemble those of Milano, with the addition of

automobiles. Biella, not far to the north, is an important woolens center.

Genova (Genoa), 0.670, is not in the Po Valley itself, but it serves as its western port as well as the main port for Switzerland and as a supplemental port for southern Germany and western Austria. Though the harbor is poor, it is extremely active, ranking second only to Marseille on the Mediterranean coast of Europe. The Po Valley is nearby, across a pass only 1,800 feet high. Genova's many industries are related to iron smelting and cotton importation. The climate is fairly favorable to cotton spinning, whereas in most Mediterranean lands the summer is too dry. Ships are built. Long a rival of Venezia, it indirectly mothered the Commercial Revolution, which placed both far off side in the matter of sharing benefits. Genoese captains either discovered or trained men to discover practically all the lands and routes that were brought to light by the Voyages of Discovery. They trained English, Spanish, and French navies and commercial fleets. The only maritime Europeans who did not find it necessary to employ them were Scandinavians and Hansards. In modern times, as if in gratitude, Genova has found its location far better than that of its old rival, Venezia, so that, belatedly, it has come to share in the benefits of a Commercial Age to a far greater degree than the port at the head of the Adriatic. Most goods are shipped westward in the Po Valley; so Genova is a far more important export center than Venezia.

TUSCANY Tuscany, ancient Etruria, is more Mediterranean racially and culturally than the Po Valley. During antiquity it was a source of tin. Though much land is hilly or mountainous, population density is on the order of 500 per square mile. The Arno Valley is a rich source of food. The route to Bologna leads from its head, as does another to Arezzo, a junction point to all parts of southern and central Italy. The Ligurian coast, with Savona, Genova, and Spezia, is readily accessible. Here flowered the most important cultural and artistic developments of the late Middle Ages, and here arose the Renaissance.

Firenze (Florence), 0.380, is a leading cultural center and attraction for tourists. Around its many monuments and art galleries is a thriving industry, concerned with such activities as making iron and steel goods, straw hats, and macaroni. *Siena*, to the south, is Italy's best source of lignite. *Pisa*, to the west, is a cultural and tourist center of high rank. At its leaning tower Gali-

leo demonstrated one of the important principles of gravity, that heavy and light objects fall with the same speed. In its important cathedral the swinging of a chandelier is supposed to have inspired him to investigate the action of the pendulum. Many regard these events as the beginning of the Renaissance, which ended Europe's medieval period. *Livorno* (Leghorn) serves as the seaport of Tuscany and manufactures glass, copperwares, and olive oil. The Island of Elba supplies iron ore, and local lignite serves as fuel in Tuscan industry.

LATIUM Latium is relatively poor territory with many large areas of infertile soil, hot summers, and wide coastal marshes. Much land is given to grazing, and rural population density is about fifty per square mile, far below the general average for Italy. In better parts of the Po Valley it is on the order of 700. The Alban Hills, just southeast of Rome, however, are extremely productive, providing abundant harvests of olives, figs, grapes, and fruits. Malaria was introduced

during the Second Punic War, 218-201 B.C., and though considerable progress has been made in draining the Pontine Marshes southeast of Rome, they are not nearly reclaimed today, according to Dutch standards, and remain unhealthy.

Roma (Rome), 1.64 million, is large because of its ecclesiastical, political, and historical importance. Though supplied by hydroelectric power from nearby Tivoli and Subiaco to the east, it is not industrialized beyond the ordinary demands of a city its size, nor does its commercial significance compare with that of many other Italian cities. Vatican City occupies an area of 109 acres and has a population of somewhat over one thousand. Prior to 1870, the Pope enjoyed temporal sovereignty over the Papal States, which covered some 16 thousand square miles of central Italy and had a population in excess of 3 million. When this territory was incorporated in the Kingdom of Italy, Pope Pius IX remained temporal sovereign of only the palaces of the Vatican, Lateran, and Castle Gandolfo, in the Alban Hills. The Lateran Treaty of 1929 ended a long period of disagreement between the Church and Italy, as well as voluntary confinement of the Pope in the Vatican. St. Peter's, the Vatican gardens, museums, palaces, and buildings are among the main tourist attractions of Rome. The other great attractions date mainly from antiquity.

CAMPANIA Campania is noted for its scenery and rich volcanic soils. Vesuvius rises majestically above the Bay of Naples and has been active many times since A.D. 79, when it suddenly ended a long period of dormancy and blew a vast quantity of material, including much of its old summit area, high into the air to settle on Pompeii, Herculaneum, and other villages, preserving



Calabrian village (Office of Foreign Agricultural Relations, U.S.D.A.)

them intact. Modern excavation had turned these places into museums, highly instructive as to the life of the first century. Sorrento, with its magnificent cathedral, the Isle of Capri, and many other attractions draw numerous visitors.

Napoli (Naples), 1,014, is the great city and only good port on the west coast of southern Italy. Though its university was established in 1224, nearly a century prior to that of Rome, the city has been a commercial rather than an educational or cultural center. Within recent years it has offered many attractions to industry, such as exemption from taxation for a short period, but aside from cotton mills and such factories as might be expected in a city of nearly one million, there has been no great rush to take advantage of its cheap labor or other inducements.

APENNINES The Apennines are most densely populated and most productive in the north. Hill-sides are terraced and produce olives, grapes, and even oranges and lemons—fruits typical of southern Italy. Some petroleum occurs on the northern slopes of Emilia. The central Apennines are more rugged and barren, but their valleys produce cereal crops, flax, hemp, olives, and grapes. The Nera is used to provide power for steel mills at Terni north of Rome. The proportion of barren land increases southward, where much territory is given to pasturage, and olives are the principal product of agriculture.

ADRIATIC COAST The Adriatic coast is served by rather good ports at Ancona, a center for wine and olive oil from Marche; *Bari*, a rapidly growing center of olive oil export; and *Brindisi*, former point of departure for steamers carrying fast mail to India and now serving in a similar capacity for air traffic. These and *Taranto*, on the Gulf of Taranto, are commercial centers of some importance. Apulia has little rainfall and long, hot summers. Its wheat ripens in the spring and is particularly desirable for macaroni and other paste products. Calabria, to the west, is grazing territory, in which small villages perch on hills.

SICILY Sicily is much older culturally than the rest of Italy. With Carthage it controlled trade between the Greek and Roman seas as early as 550 B.C. During the Middle Ages it was in the hands of Norman kings, who also held the African coast between 1135 and 1153. Charles V of Spain, King of the Two Sicilies (the island and much of southern Italy) seized Tunis in 1535. Within recent times interest in the land bridge toward Africa has been revived, without much success, by Italy itself.

The rich volcanic soils of Sicily more than compensate for rough terrain. In ancient times the island grew more wheat than Italy. Rome imported wheat, honey, and saffron from Greek Sicily. Sicily now presents the complete flavor of Mediterranean agriculture, with wheat, olives, citrus fruits, and grapes as the principal products. Vineyards climb high on the sides of its many mountains. People always defy the possibility of volcanic outbursts, which are comparatively rare and not always destructive, when tempted by the steady returns from fertile soils. The densest population lies along the northern and eastern coasts. *Messina*, the commercial guardian of the two-mile-wide Strait of Messina, has suffered from earthquakes. *Catania*, 0.290 million, has outgrown ancient Syracuse (Siracusa) to the south as a port for shipping agricultural products. *Palermo*, 0.485, on the western part of the north coast, is the greatest export center of all and has some industry—iron smelting and shipbuilding.

Mt. Etna rises 10,741 feet above sea level, and is the main volcano of Sicily. To the north is the Lipari group of islands famous for Vulcano, which has given its name to all volcanoes, and Stromboli, one of the most destructive vents on earth.

SARDINIA Sardinia is an island of old rocks that contain iron, lead, zinc, and other ores, which are only partially exploited. Much of the interior is covered by forest. Excellent lemon and orange soils lie among its southwestern lowland valleys. Corsica, a French island a short distance to the north, is similar.

MALTA Malta, a tiny island with an area of 122 square miles and population somewhat in excess of one quarter million, has been in British hands since 1814. Though barren, it is intensively cultivated, with terrace gardens rising on its slopes. *Valetta* serves as a naval base in an extremely strategic position in command of the Sicily-Cape Bon channel. The native tongue, Maltese, is Semitic.

SAN MARINO San Marino is a tiny speck in the Apennines near Rimini. Its significance is only political and rests on the claim that it is the oldest state in Europe, tracing its founding to the fourth century. Its 38-square-mile area and population of less than 13 thousand are governed by a council composed of 60 members, 2 of whom are selected to serve as executives for terms of 6 months. Its army of less than a thousand made

no great contribution to the cause of the Allies when the state declared war on Germany in 1944.

POPULATION PRESSURE

The population of Italy was 39.97 million in 1921, 41.2 in 1931, and 46.6 in 1951. Even poor areas have rural population densities as high as 250 per square mile. Industrial development has risen, but not on a scale comparable to that of northwestern Europe. Industry has absorbed some of the population increase, but not nearly enough. Lack of coal, forest resources, minerals other than mercury and sulphur, and ineptitude toward industry on the part of large groups in the population are serious matters. Italy was formed nationally too late to have established a satisfactory colonial empire. Like Germany, it had to content itself with lands not already in the hands of such nations as England, France, Portugal, or Spain. Colonies along the east coast of Africa, Italian Somaliland, and Eritrea, are too arid to be of much use. Its conquest of Tripolitania and Cyrenaica from the Turks in 1912 came very late. Attempts to gain Abyssinia failed in the late nineteenth century, and twentieth century success lasted only a short time. Italians have turned to shipping but without as much success as Greeks and Norwegians.

Increased population has brought about many changes within Italy itself. Migration toward the Po Valley is so heavy that little gain has been shown in rural populations of the poor lands of central and southern Italy. Large migrations of seasonal workers go each year to Switzerland, France, and other nations. Germany was using Italian labor profitably before the outbreak of World War II. Belgians exploit Italian labor in coal mining. Some 95,000 Italians migrated to

Italian colonies, most of them going to Tripolitania and Cyrenaica, but nearly 200,000 have gone to French Tunisia, where they live in compact groups and cling to their own culture traits. Emigration to Argentina and the United States has been heavy, but more have gone to France than to the United States, and many have found homes in other European countries. In 1924, when the United States put quotas on various nationals in such a way as to reduce immigration from southern and eastern Europe, there were some 0.5 million Italian-born settlers in the United States, as compared with 1.3 in Europe outside of Italy. In 1940, however, they led all other nationals in United States' foreign-born population groups as shown in the Table 14.

Table 14 Foreign-born population groups in the United States, 1940

<i>Birth in:</i>	<i>(millions)</i>	<i>Birth in:</i>	<i>(millions)</i>
Italy	1.624	Sweden	.445
Germany	1.238	Czechoslovakia	.320
Russia	1.041	Hungary	.290
Poland	.993	Norway	.262
England	.622	Greece	.164
Eire	.572	Denmark	.138
Austria	.480	Finland	.117

The overpopulous condition of Italy is a serious problem to the world as a whole. It is not likely to be solved voluntarily. There is little opportunity in Italy itself to accommodate so many people without reducing vast numbers to much lower living standards than exist at present. Living standards are already among the lowest in Europe with possibilities of famine and widespread epidemic disease ever at hand. The loss of colonies is not a particularly serious matter because they could take care of only an inconsequential fraction of the surplus. In the Far East, Japan poses the same problem.

24: Iberia

The Iberian Peninsula, 232,189 square miles, is not quite so large as Texas but is well over five times as populous. Spain, 28.1 million, and Portugal, 8.6, exceed in population all of the states of New England, New York, and Pennsylvania combined by a comfortable margin.

PHYSICAL BACKGROUND

The Pyrenees are steep and rugged. Several peaks rise above 10,000 feet: Pic d'Annetto to 11,169; Mt. Perdido, 10,998; and Pic de Montcalm, 10,105. Until 1920 the only rail connections to France ran around either end of the range, but two other lines now cross the mountains. The Cantabrians isolate coastal Asturias, on the Bay of Biscay, somewhat less effectively, but the highest peak in that range, Torre de Cerredo, rises to 8,786 feet, and highlands along the coast extend westward to Sierra de Muros above Cape Finisterre.

Two thirds of Iberia is high plateau, the Meseta. A line between Spain's northern and southern capes, Ortegal and Marroquí (not Gibraltar), separates territory 75 per cent above 2,000 feet on the east from 75 per cent below 2,000 feet on the west. The high tableland is not particularly level. Considerable areas rise above 5,000 feet, especially in the north, and deep valleys lead into it, with most drainage into the Atlantic. Many ranges rising above the general level of the plateau are distinct enough to have individual names. These have been formed by folding and faulting. Some of the residual highlands between deeply dissected valleys have also been named because they rise abruptly above territory on either side, even though their summit elevations attain only the general level of the Meseta.

Sierra de Gata, Sierra de Gredos, and Sierra de Guadarrama, between Douro (Duero) and Tagus (Tejo, Tajo) drainages, form the most continuous and culturally most significant highland divide of the Meseta. Leon and Old Castille (Castilla la Vieja) lie to the north; Extremadura and New Castille (Castilla la Nueva) lie to the south. Sierra Morena forms the steep southern boundary

of the plateau. The isolated Sierra Nevada rises higher than the Pyrenees.

The Meseta is composed of old rocks that contain considerable mineral wealth, but do not weather into very good soils as a rule.

Only one of the large river basins of Iberia, the Ebro, which drains Navarra and Aragon, leads to the Mediterranean. Minor streams lead eastward through Valencia. The relatively small Segura system drains part of Murcia, and several short rivers lead southward from the Sierra Nevada into the westernmost arm of the Mediterranean. In general, however, the Mediterranean-Atlantic divide lies well to the east. Not much territory west of longitude 2° W. drains into the enclosed sea. Iberia reaches 9° 30' W. and only a small part of Spain lies east of London.

The Guadalquivir, the great river of Andalusia whose valley extends between the Sierra Morena and the Sierra Nevada, reaches the Atlantic Gulf of Cadiz well west of Gibraltar. The Guadiana, which forms much of the eastern boundary of southern Portugal and drains territory on the northern side of Sierra Morena, discharges into the western part of the same gulf. The Tagus (Tejo in Portugal, Tajo in Spain) is the longest river of all, 550 miles, rising in Montes Universales of southern Aragon, and it also is the most important from a cultural viewpoint. It lies somewhat farther south than an



Iberian Peninsula: relief

east-west line that would divide the peninsula into equal north and south parts. The Douro (Duro in Spain) is the remaining main river system, discharging into the Atlantic at Porto, in northern Portugal.

The rivers form a centrifugal pattern, like those in the European part of the Soviet Union. Their lowlands are the most significant agricultural parts of Iberia and the population of each differs culturally from those of the others. Each valley has tended to become a political nucleus at some time or other and has generally proved to be self-assertive with regard to its own particular interests.

Only the southern and eastern coasts have true Mediterranean climate, with cool winters, hot summers, and winter rainfall. Much of the interior verges on steppe climate. The northern and western coasts have a maritime climate much like that of northwestern Europe, with abundant precipitation at all seasons, average January temperatures somewhat below 50° F. and July below 70°. In Madrid, July is above 75° and in Andalusia, between 75° and 80°. Freezing temperatures are not uncommon in central Iberia but are rare along coasts.

About 35 per cent of Iberia is normally under cultivation, 25 per cent in pasture, 20 per cent in forest (but only about 5 per cent of Portugal), and 20 per cent is waste. The waste and pasture lands lie on mountains and in the interior.

Mineral wealth is very considerable. The north coast has rich deposits of iron ore that supplies smelters in Wales or finds its way to lands as remote as Czechoslovakia. The Sierra Morena has long been an important source of copper, mercury, silver, lead, zinc, and other metals. Less well developed minerals occur at many other places. There is a general deficiency in coal or other fuels, so that metal ores are exported in the crude state.

CULTURE BACKGROUND

During the latter parts of the Ice Age the cultures of Iberia were very close to those of northern Africa, as are the native plants and animals today. The Strait of Gibraltar may have been closed at times of low-level, glacial-stage seas. Many think that the story of the flood, which took various forms but was universal among Mediterranean and Levantine peoples of antiquity, may have had its origins in the spilling of Atlantic water across the sill, into the Mediterranean Basin.



Iberian Peninsula:
political divisions
and Moorish invasion

causing widespread catastrophes or large population displacements around the shores of the low-level sea. This whole matter is open to debate, but whether true or not, artifacts show that the culture of primitive hunters who dwelt around north African lakes was very much the same as that north of Gibraltar. The strait is only a little over eight miles wide where narrowest and is easy to cross under present conditions. If it existed during glacial stages, it was much narrower.

About the time when Greeks were appearing south of the Vardar, Iberia was inhabited by a Mediterranean people, the Iberians. Various Alpine tribes were making their ways into and across the Pyrenees, but in not very large numbers; so the original Mediterranean stock remained quite pure.

Levantine Phoenicians reached Gibraltar in about the fifteenth century B.C. in considerable numbers, establishing a colony at Cartagena in southeastern Iberia. Greeks followed in the seventh century B.C. A good deal of Levantine and Greek blood exists along the southern and southeastern coasts today, largely as a result of these early invasions. Carthage used southern Spain as a source of tin, gold, copper, silver, lead, mica, and cinnabar (an ore of mercury), useful for making a deep red pigment, vermilion. Rome conquered coastal Spain, ending Carthaginian control, in 201 B.C.

Nordic invasions of Mediterranean lands were threatened for several centuries before Rome actually fell. During the declining days of the Roman Empire it became more and more difficult to hold the frontier along the Rhine and Danube. Early streams of Nordics crossed into Roman Empire lands. By A.D. 409 some appeared across the Pyrenees. The Suevi settled in considerable numbers around Braga, north of Porto, in Portugal. Goths established an important kingdom in northwestern Spain. Vandals, who escaped Gothic conquest, crossed Gibraltar and eventually established themselves in Tunisia. The most striking remnants of Nordic culture traits and racial heritage are centered in northern Portugal, Galicia, and Leon.

Few events of history are more interesting than the speed with which Mohammedanism spread from western Arabia. Mohammed died in A.D. 632. By 711, Moors appeared across Gibraltar, bringing the religion of Islam to Spain. Their invasion spread across most of Iberia and into southern France.

Northwestern Spain, attractive to Nordics because of its forests and adequate precipitation, was repellent to the Moors, who, like Mongols, were used to open spaces and demanded pastures

for their animals. Asturias, Galicia, and much of northwestern Iberia therefore escaped the Moorish invasion. The Nordic peoples of the northwest formed the nucleus that was responsible for the ultimate expulsion of the Moors. By 1147 they were driven from Portugal, and by 1237 from northern Spain. It was not until 1492, however, that Moorish control ended in Granada in southern Spain.

The significance of the Moorish occupation can hardly be overemphasized. It lasted a long time, 781 years. If we think of a similar interval extending back from today we arrive at a date in English history half a century before the barons wrested the Magna Carta from King John, or almost to the time of the Second Crusade, or to half a century before Genghis Khan reached Europe, or more than three and a quarter centuries before Columbus made his first voyage to the West Indies. There was considerable mixing of blood, but this was not very significant because the predominating racial stock of the Moors was Mediterranean, like that of the Spaniards. More important was the contribution to culture. Spanish architecture is deeply indebted to these Africans for its most attractive elements. Spanish agriculture is backward except where the Greeks or Moors introduced irrigation and other advanced practices. The religious purpose of the invasion eventually failed. All of Iberia is strongly Roman Catholic today.

Both Portugal and Spain took early leadership in explorations and land acquisitions during the Voyages of Discovery. Within a few weeks after Columbus returned, the Pope divided all new lands among two powers. Portugal was to have the Eastern, and Spain the Western Hemisphere. England, Holland, Scandinavia or other nations were not sufficiently important to be considered. English and Dutch discoveries were made in defiance of the papal ban, but those nations were Roman Catholic at that time and in general tried to find northwestern or northeastern passages to eastern Asia rather than new territory for their own use. The Iberian nations were the originators of the Commercial Revolution.

Though Portugal has been independent almost continuously since 1147 when Alphonso I captured Lisbon from the Moors, it had the misfortune of coming under Spanish rule between 1580 and 1640. In 1500 it had something of a head start commercially, but its initial advantage in the Commercial Revolution was rather effectively killed by Spanish orders that transferred all foreign trade to Spain.

Spain rose rapidly to become the wealthiest and most powerful nation in Europe when silver from Latin America began pouring into its coffers. Its empire in theory comprised the Western Hemisphere. A series of European wars, however, wasted its wealth and manpower. The empire vanished, piece by piece, the greatest blows occurring during the nineteenth century when practically all Latin American countries became independent, the *coup de grâce* being dealt by the United States in 1898 when Cuba and the Philippines were lost. Portugal has had more success in holding its empire.

To find most of these colonies it is necessary to have a rather good map of Africa and to concentrate one's examination on the less-useful coasts of that continent. The exceptions are in the Portuguese list. Even a few tiny fragments of its Asiatic empire remain: Goa, Damão, and Diu on the west coast of India, a tiny island near Canton (6 square miles), and part of an East Indian island.

The interests of Iberia have faced first in one direction, then in another. The earliest coast of consequence was south, in Phoenician and Carthaginian days. Greeks and Romans made the east coast more important. Moors again turned attention to the south. The Commercial Revolution initiated west coast interests. Recent years have seen the east coast gain greater meaning with the rise of Catalonia (Cataluña) and Valencia.

It is somewhat unfortunate that we insist on calling the larger of the political units of Iberia "Spain," for no Spanish-speaking person can pronounce that word, or any *s* followed by a consonant at the beginning of a word. The real name of the country is España.

Patriotism is ordinarily directed toward local areas rather than toward Spain as a whole. A man thinks of himself as a Castilian, Gallician, or Andalusian rather than as a Spaniard. The

Portuguese have been successful in their separatism. The Catalans are particularly eager to be freed from ties that bind them to the rest of Spain.

Aside from local dialects, there are four main Romanic languages in the Iberian Peninsula: Portuguese, Gallegan (to the north, in Galicia), Spanish, and Catalan. The latter is spoken not only in Valencia and Catalonia but also in a small part of southern France, the Balearic Islands, and Italian Sardinia in the vicinity of the town of Alghero. The rest of that island speaks Sardinian, which is neither Italian nor Catalan. French Corsica, to its north, speaks Italian.

Little effect of the Industrial Revolution was felt in Iberia except in mining districts, particularly in Asturias, until quite recently when Catalonia began important manufacturing activities. An agrarian revolution started in 1931 but died in the Civil War of 1936-1939. This war was extremely destructive. A nation already backward by western European standards was retarded many years in its development.

CULTURAL LANDSCAPES

The Tagus is the most significant cultural boundary in Iberia. Though the Moors briefly occupied lands to its north, their influence was minor in changing cultures and landscapes. To the south is Moorish Spain with its interesting architecture, its Mediterranean farming with terracing and irrigation, where horticulture prevails over field agriculture, and where life is adjusted to a slow, easygoing tempo.

Murcia, now a source of typical Mediterranean products, wheat, olive oil, dried figs, citrus fruit, raisins, and wine, was the earliest territory to come into foreign hands and in many ways is the most affected by outsiders. Levantine Cartagena is still active as a port, exporting fruits and some iron. Inland Murcia, built by the Moors, is an active commercial center and railroad junction. The Segura furnishes water for irrigation, and horticulture is highly developed. By tradi-

Table 15 Remnants of Iberian empires (1946)

Portugal Colony	Area (thousands square miles)	Population (millions)	Spain Colony	Area (thousands square miles)	Population (millions)
In India	1.5	.657	Guinea	10.0	.140
Macao		.340	Morocco	18.3	1.100
Timor	7.3	.437	Rio de Oro	109.2	.032
Cape Verde I.	1.5	.175	Ifni	1.0	.020
Guinea	13.9	.415	Fernando Po	.8	.024
Guinea I.	.6	.049		139.3	1.316
Angola	481	4.5			
Mozambique	298	5.0			
	803.8	11.57			

tion the Sephardim, or Iberian Jew, is supposed to have spread from Murcia. The skin of these people is darker than that of northern or eastern European Jews, and their racial stock is typically Mediterranean rather than Alpine. There is probably a good deal of Levantine blood in their veins which is by no means true of most other Jews.

Andalusia includes land surrounding much of the Sierra Nevada, and the Guadalquivir Valley. It contains both the largest lowland in Spain and the highest mountains.

Almeria, in the extreme southeast, exports silver and lead. Malaga, 0.293 million, northeast of Gibraltar, was long the largest city in Spain. The Guadalquivir Valley leads north to a productive hinterland. To the east is an attractive agricultural district, irrigated by snow-fed streams that descend the northern slope of the Sierra Nevada. In addition to ordinary Mediterranean crops, some cotton is grown and sugar beets are fairly abundant toward Granada. It was there that the Moors had the strongest hold and remained for the maximum period. The Guadalquivir leads to passes to Seville, the Sierra Morena, and other parts of Spain. Malaga as a port offered the advantage of trade with other Mediterranean cities without the necessity of going outside of the Strait of Gibraltar. Malaga led as a cultural and educational center for many centuries. Now it lags considerably behind Seville in Andalusian leadership.

Along the Gulf of Cadiz, outside the Pillars of Hercules—the Capes of Gibraltar (Spain) and Sierra Bullones (Ceuta)—are the extremely old ports of Cadiz (Gades) and Huelva. These depended on the products of mines, not agriculture. Huelva is still the outlet for the Rio Tinto (Minas de Riotinto) copper mines. Cadiz, long the commercial outlet of the Guadalquivir Valley, now shares that distinction with other places, especially Seville. It produces and exports salt and carries on most of the banana trade with the Canary Islands.

British Gibraltar, 25,000, and an area of 2 square miles, in addition to being the most conspicuous landmark along the Strait and an elaborately tunneled and impregnable fortress, has an excellent harbor, busier than Cadiz, and it serves as an important coaling station.

Seville, 0.383, is the leading city of Andalusia and southern Spain. As ancient *Hispalis* it stood at the head of navigation on the Guadalquivir, some fifty-four miles inland. River boats, however, were able to ascend to Cordoba. The Alphonso XIII Canal, some seventy miles in length, now permits ocean-going steamers to reach Se-

ville, making it the main port and commercial outlet of southern Spain. It shares with Almeria the export of silver and lead from Linares, toward the eastern end of Sierra Morena, and it is the chief export center for iron from the Sierra Nevada. Though largely Moorish, Seville has become industrialized, with cork factories, iron foundries, and food-processing establishments. It is served by an elaborate railroad network.

Andalusia produces tobacco, citrus fruits, olives, wheat, and raisins. The highest priced Spanish wines originate there. Irrigated lands grow sugar cane and sugar beets. Groves of cork oak are an important source of revenue, as is fishing along the coast.

Portugal was quite largely in Moorish Iberia. Its people are somewhat more mixed racially than those of southern Spain. Phoenicians, Negroes, Nordics, and others have left important traces of their presence, especially around the old seaports. The country has been more backward than Spain in many ways; over 75 per cent of the population is considered illiterate. About one third of its area is cultivated, less than one fifth is in forest, and about half is pasture or waste. The Azores, 922 square miles, 0.232 million population, and Madeira Islands, 314 square miles, 0.211 million population, are included politically as provinces of the country. They were originally uninhabited and have been transformed into fairly typical Mediterranean islands culturally.

Portugal is predominantly agricultural and a land of small villages. Wheat, maize, and pigs are the main concerns of the southern part of the country; maize and cattle to the north; and rye, sheep, and goats in the northeastern highlands.



Iberian Peninsula: index map

The density in livestock increases southward as does variety in crops. Tomatoes, figs, and oranges supplement olives and wheat as Mediterranean crops. Toward the north, where it is rainier and cooler, oats and rye are important cereals.

Wine making is the leading industry. The types produced in the south are exported in large quantities to Brazil. The port wine of the Douro Basin is in demand in England, the United States, and other countries. Cork manufacturing ranks second among industries. The cork oak grows widely both in the north and south. In normal times Portugal supplies about one half of the world's needs.

Coal and hydroelectric power are practically wanting. Forests are unable to supply fuel demands for industrialization. Pines, chestnuts, and oaks are more useful in furnishing mast for pigs and as sources of timber.

Portugal is well supplied with metal resources. The main mining districts are in the south, along the margins of the Meseta, and produce copper, some tin, lead, iron, and pyrite, a source of sulphuric acid. Europe's largest deposit of wolframite, from which tungsten is recovered to make extremely hard steel, filaments for electric lights, etc., occurs at Fundão, in Tejo drainage, west of the Spanish Sierra de Gata. Uranium ores are mined farther north on the south side of the Douro. Sulphur, lithium, and titanium are also among the mineral products of Portugal, as well as excellent clay for making porcelain wares. Practically all metal and mineral products are exported. Some coal from England permits a meager amount of industrialization.

Sagres, on the eastern side of Cape St. Vincent, the southwestern corner of the Iberian Peninsula, was an ancient port of call that has no modern equivalent. Setúbal, not far south of Lisbon, is a center of sardine canneries. Sardines and anchovies rank high among Portugal's exports.

Lisbon (Lisboa), 0.794 million, is the capital, leading port, educational center, and main industrial city. Its factories turn out woolens, iron-ware, and many minor items. It builds ships and exports wine, corks, copper, and products of the tropical colonies, rubber and cacao. In spite of the importance of Portuguese fishing, Lisbon imports fish from Great Britain, Iceland, and Norway. It imports petroleum from the United States and cotton cloth and coal from England.

Oporto (Porto), 0.284, is the leading city and port of the north, serving not only the Douro Basin but a strip of coastal lands as well. The harbor at Leixões (Matosinhos) is an active fish-

ing and commercial center. About half the value of Portugal's exports is in wine and much of it is port wine shipped from Oporto. The main industrialization is in textiles, cottons, and woolens.

Galicia and Asturias are non-Mediterranean provinces of Spain. Lying far north of the Tagus, they lack all traces of Moorish influence. Galicia is so foreign to Spain that it still has its own language, Gallegan. Below the pine-clad mountains of northern Spain are slopes that produce poor-quality wine, mainly for local use or export to France. Still lower are fields raising flax of excellent quality, potatoes, sugar beets, and maize. Population density is greater than in practically any other part of Spain, and roughly one third of all the nation's cattle graze in northwestern fields.

Gothic influences are strong in Galicia and Asturias. The land is divided into small farms and people are extremely democratic. *Hidalgos*, a class of nobility similar to the squires of England, are typically rather well-to-do landowners.

The effect of the Industrial Revolution was more keenly felt in Asturias than in other parts of Iberia. Coal occurs near Oviedo and accounts for some twentieth century industrialization. Both iron and manganese are abundant. Gijón, the port for Oviedo and La Coruña, exports cattle, flax, and iron ore. Santander not only exports iron but has blast furnaces and engages in iron and steel industries. Bilbao is also industrialized, building ships.

Fishing is important, especially toward the west. A considerable tourist trade has developed, mainly eastward toward the French coast.

Basque territory lies at the western end of the Pyrenees and westward to Bilbao. Nationally some of the Basques are French, but the great majority are Spanish. Racially they are Mediterraneans, but their language is not related to any other. The vocabulary is almost devoid of words and roots common to other tongues and the structure is agglutinative, like Manchurian and other Far Eastern languages. Primitive words are run together into compounds with little or no change in meaning. For some strange reason a small group of people, isolated by slopes and forest, have here preserved what many think may have been a tongue spoken long before Alpines appeared in Europe. Many Basques have emigrated to the United States, where they have taken part in activities ranging from sheepherding in the Northwest to leadership in business and education.

The *northern Meseta* lies chiefly in the province of Old Castile, with León to the west, and in the Douro watershed. Though the rural population density is greater than in the southern Meseta,

running above 50 per square mile generally, there are few real towns and cities. In the main it is a territory of large estates owned by descendants of the old Gothic aristocracy who gave birth to New Spain by forming the organizations that expelled the Moors. Wheat is the main crop, with oats and rye in higher territory. The leading city, Valladolid, is a center for agricultural industries, such as flour milling. From it rail lines diverge toward all parts of Spain and Portugal. The route south to Madrid passes through Avila, from whence the Moors were driven into Tagus drainage across a pass between the Sierra de Gredos and that of Guadarrama.

The southern *Meseta* is drier and less densely populated. New Castile includes most of the plateau itself. Extremadura, to the west, spreads across the *Meseta* margins and includes a good deal of lower territory in the Tagus and Guadiana drainage basins. Moors remained many centuries in the southern *Meseta* and their influence has been comparatively strong.

One of the greatest contributions of the Moorish invasion from the economic standpoint was the introduction of a type of sheep from the Atlas Mountains of northern Africa, the breed known as Merino. These fine wool producers have been distributed widely from the southern *Meseta*, one highly developed strain having later been bred in France as the French Merino. Even in South Africa sheep raising was not profitable until Merino sheep were introduced.

Grazing lands spread widely in the drier parts of the *Meseta*. Villages and towns are located where water exists, in semioasis fashion. Olives thrive on the warmer dry slopes. Cold winters and severe winds prevent raising many typical Mediterranean crops, except in valleys and lowlands particularly in Extremadura.

Madrid, 1.4 million, is chiefly a political and commercial center. As capital since 1561, it has the advantage of central location. Strangely enough very few nations have regarded this matter very seriously in locating capitals. Even in Spain the fact that Madrid lies close to the boundary between Old and New Castile was of greater significance than its approximation to the center of Iberia. The railroad network made Madrid its hub, so that direct lines radiate toward all significant centers in the centrifugal valley systems of the Peninsula. From the climatic standpoint, Madrid has little to recommend it. It gets little more than 15 inches of precipitation annually, has cold winters and hot summers. Madrid has only such industries as a city of its size demands.

Toledo, not far south of Madrid, on the Tagus, is a picturesque Moorish city in far more attrac-

tive surroundings. It could have served as a magnificent capital for New Spain. Still farther south is Almaden, one of the world's leading sources of mercury. In the extreme southwest, on the northern slopes of the Sierra Morena, is the Jerez District, famous for its brandy.

Aragon, in the Ebro Valley, is relatively barren and cold in winter, so that typical Mediterranean crops are not in evidence, except for olives and vines which are relatively hardy. The middle Ebro is navigable for about 250 miles and in part canalized, but the lower river passes through about 100 miles of winding gorge, which is avoided by all main routes to the Mediterranean. Saragossa, 0.267, is located at a bridge site on the Ebro. It is the only great route and commercial center. Industry consists of flour mills, sugar refineries, and iron and steel mills.

Catalonia, along the Mediterranean coast east of Aragon and north of the mouth of the Ebro, is modern, industrialized Spain.

The Catalan is Mediterranean in stock but is taller than most others, mainly as a result of higher standards of living. His culture was deeply influenced by Frankish contacts during the eighth and ninth centuries. His language is closer to Provençal of the coast of southern France than to Castilian Spanish. Catalonia is rich agriculturally, has nicely balanced resources, the greatest population density, and by far the largest city in Iberia. The cleavage between Catalan and Spaniard is old and deep. While it is doubtful that Catalonia could thrive economically as a separate nation because of its small size and the fact that over one third of all Catalans live in a single city, the people have strong separatist feelings and resent the economic and cultural drag of Spain. As a single state Catalonia might duplicate the experience of Austria and find that the burden of supporting a great city might be worse than that of affiliation with a backward country. In 1932, Catalonia was granted considerable autonomy.

Inner Catalonia, along the basin of the Segre River, is relatively backward and much like Aragon. The milder winters along the coast permit greater agricultural diversification, which is put into practice by a people in many ways more like French than Spanish agriculturalists.

Barcelona, 1.3 million, was great in medieval times but suffered decline when the interests of Iberia turned toward the Atlantic, and was far off track with regard to Moorish contacts. In addition to food and fruit processing, wine making, and other Spanish activities, it has become highly industrialized. Its woollens, cottons, and silks have

a firm hold on the Spanish textile market. There is considerable heavy industry and the city manufactures many specialties, such as electrical goods. Barcelona turns to Spain for many raw materials and is aided by having the Spanish market within its customs frontier.

Valencia continues Catalan-speaking territory along the coast south of the Ebro. It felt Moorish influences only in a minor way. Soils are fertile but require irrigation to bring them into productivity. Only the grape and olive grow on the drier slopes above the highest irrigation ditches, but a wide variety of fruits and vegetables supplement cereal crops on lands below. The city of Valencia, 0.451, is an export center for citrus and other fruits, and carries on a little industry, because it has hydroelectric power.

The *Balearic Islands*, covering something under 2,000 square miles, with a population of nearly 400,000, are a Catalan-speaking Mediterranean outpost of Spain. *Ceuta*, on the African coast, is the Spanish equivalent of Gibraltar. It is mainly a

fort, with an area of 5 square miles and population of 40,000. The *Canary Islands*, somewhat under 3,000 square miles and over half a million population, lie off the coast of Rio de Oro. The Balearic Islands, Ceuta, and the Canaries are all considered parts of Spain rather than colonies. Their economic significance is slight, but the Canaries furnish tropical products, particularly bananas, to Spanish markets.

Andorra, a tract of 191 square miles, lies on the Spanish side of the east-central Pyrenees summits. Its population of hardly more than 5,000 is scattered among 6 villages. The little state has been independent since 1278 and was granted a constitution as a republic by Napoleon in 1806. It is governed by a council of 24 members, who since 1941 are elected by the votes of family heads. Prior to that it had universal suffrage. Catalan is the official language, and most of the inhabitants are Roman Catholics. Like San Marino, Liechtenstein, and Luxemburg, Andorra is a curious political relic of Middle Ages territorial mincing. Stamp collectors and tourists contribute to the support of these small countries.

25: Western Transition Zone: France, Switzerland

France is the largest country in Europe west of the Soviet Union. It ranks fourth in population.

Table 16 Areas and populations of leading European nations (1953)

<i>Area (thousands, sq. mi.)</i>	
Soviet Union	9,619.8
France	212.7
Spain	196.6
Germany	182.7 (West, 94.7)
Sweden	173.3
Italy	116.2
<i>Population (millions)</i>	
Soviet Union	200.0(?)
Germany	67.3 (West, 48.1)
United Kingdom	50.4
Italy	46.6
France	42.2
Spain	28.1

France is compact, being nearly a square with 600-mile sides. Though its area is only about 80 per cent that of Texas, a square with sides equal to those of France having its northwest corner in Chicago would reach about to Birmingham, Alabama, on the south and to Chesapeake Bay on the east. In latitude, however, France lies much farther north. Its southernmost point in the eastern Pyrenees lies on about the same parallel as the southern boundary of Wisconsin, and its northernmost point on the North Sea is about equivalent to the southern tip of Hudson Bay. Paris lies north of Duluth, and Marseille north of any part of Massachusetts.

PHYSICAL GEOGRAPHY

In spite of high latitude, by standards of the eastern United States, France has relatively mild climates. Temperatures in Brittany are cool but not cold at all seasons. The climate there is typically maritime. Only the uplands of France experience January temperatures averaging below 32° F. At some places along the French Riviera January is warmer than 45°. Continental summers are experienced in rather mild form at inland points, but few places have a July above 75°. In the

upper parts of the Central Plateau it is below, and in the uppermost Alps and Pyrenees, it is even cooler.

The immediate Mediterranean coast experiences rather low annual precipitation and true summer drought; in no place, however, is the rainfall as low as 20 inches. Areas regarded as more or less "desert" in southern France are places where porous gravel permits water to seep below the surface about as fast as rain falls, leaving little for plants. Some of the higher mountains in southern and southeastern France have annual precipitation in excess of 60 inches, with a considerable portion falling as snow. Along the northwestern coast, fall and winter are the wettest seasons, but every summer month receives ample precipitation. The yellowish-brown landscapes of the Mediterranean coast in summer, popularized in the paintings of Van Gogh and others, cover only a very small fraction of the country. France in general is a land of green summer landscapes. Most of it receives considerably more than 35 inches of rain per year, and this amount is quite uniformly divided among all months. The west coast of the United States, from San Francisco north to the Straits of Juan de Fuca, displays similar climatic characteristics.

From the topographic standpoint, France is highly diversified. About 20 per cent is mountainous, reaching to the highest elevations in western Europe. About 25 per cent is plateau, a considerable portion being above the timber line. Over half is lowland, especially in western France where the southwestern terminus of the European Plain extends to the Pyrenees.

The soils of France are about as varied as those of the United States, and they exhibit greater differences than those of any other western European nation. Below the barren rock and almost soil-free rock debris and glacial deposits of the Alps and Pyrenees are types ranging from the gray, podsollic soils, typical of the mixed forest of the Soviet Union, to the deep brown soils of Mediterranean valleys which alternate with bright red soils where the bedrock is limestone. From highland peats and other wet, mucky soils, similar to those of the higher parts of Great Britain, there

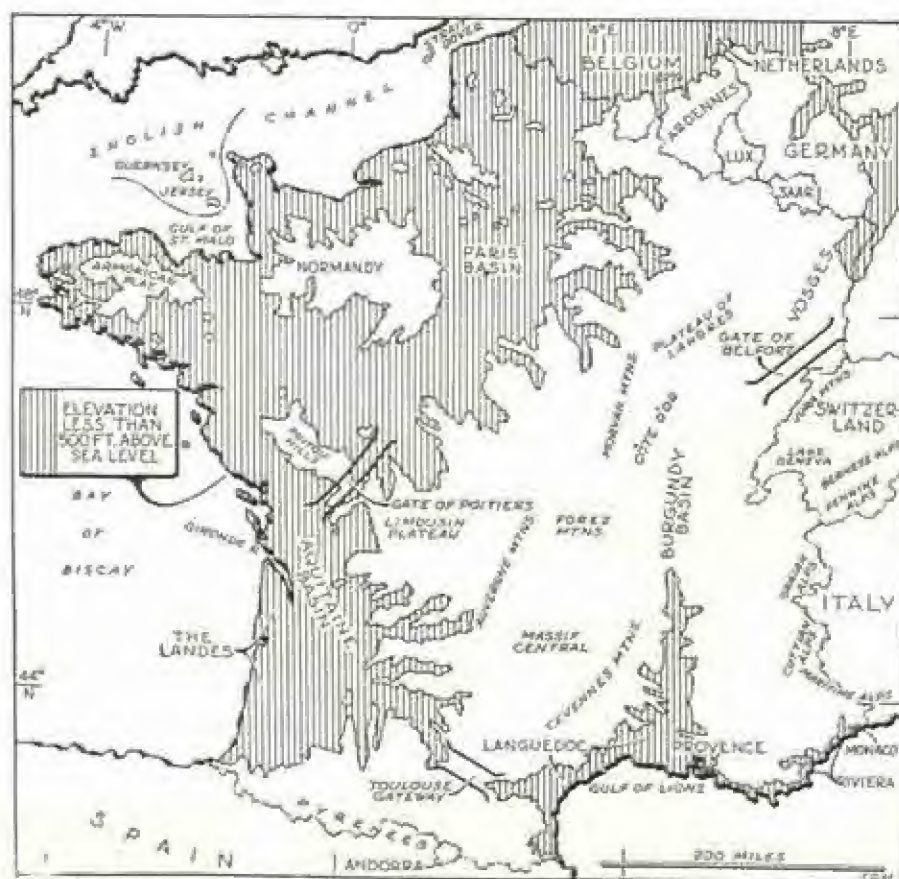
is a gradation leading to humus-deficient sands and gravels, similar to those in deserts. The younger rocks in the northwest yield soils as fine as those of southeastern England. In Burgundy and other interior valley districts are terrace and alluvial deposits with soils similar to those of Saxony or the Rhine Valley.

NATURAL REGIONS

Paris Basin resembles southeastern England closely. The same chalk rock layers that outcrop at Dover appear across the Strait at Calais. The same trend swings southeastward around Paris in a great arc that passes through Reims, Troyes, and Orleans. Toward Paris and the lower Seine Valley are the outcrops of younger rocks. Paris itself has a location very similar to that of London in that it lies in the central part of a young-rock, rich-soil, agriculturally productive basin. Concentric escarpments surround Paris on all sides except the northwest. Their steep faces are outward, so that an invading enemy always had the handicap of

being confronted by abrupt scarps, whereas gentle slopes permitted easy occupation of defensive summits from the Parisian side. The ridges held up by more resistant rocks are similar to the English Downs. The vales between provide rich strips of land for cereal crops.

Half of the wheat of France grows in and around the Paris Basin. Toward the coast, where there is too much rainfall for the more valuable cereal, grows some 60 per cent of the French oats crop. To the northeast are the principal sugar beet fields. Toward Paris and other cities are excellent truck or market gardens, raising a highly diversified number of vegetable crops. As in England, the drier uplands are used for pasturing sheep. A more favorable climate, however, permits extensive cultivation of the vine on slopes. The chalks of the valleys of the Aisne and Marne produce a grape not particularly valuable for ordinary types of wine, but long ago it was discovered that the product could be utilized as champagne if bottled slightly before the fermentation process had reached conclusion. Within heavy bottles, stoutly corked, the final stages of fermentation yield carbon dioxide, so that the wine is naturally



France: relief

carbonated. Though generally considered inferior by connoisseurs, champagne commands a premium price in some markets, especially in the United States, and Reims, the main center for its production, has profited accordingly. Ordinary dry wine is produced in large quantity south of Paris along the middle Loire.

Coal deposits extend from Belgium into the extreme north of France, Lens and Anzin being the main producing centers. More coal lies at greater depth but can not be produced economically. Lille and Valenciennes are industrialized, making textile machinery and other iron and steel goods. Rouen, on the Seine, has always ranked as the leading French port for cotton importing. It and many small towns engage in textile industry, but the main thread and cloth centers lie to the north, near the coal. Lille engages in spinning. Amiens, on the Somme, and St. Quentin, on the Oise, are cotton-weaving centers. Dunkerque is the great wool importing port. Roubaix, Fourmies, and many other towns along the Belgian border make woolen yarn and cloth, as does Reims, and, to the south of Paris, Orleans.

Paris, the overwhelming conurbation of the

entire basin, will be considered later in connection with urbanization.

Northeastern plateaus extend from the Vosges, just west of the Rhine Valley, to the Ardennes, on the frontier of southern Belgium. In general these uplands are old rock and poor soil areas, but many valleys have rich alluvium or terrace deposits that yield excellent crops.

To the north is a corridor region that leads along the Meuse and Sambre of Belgium to the northern part of Paris Basin, with connecting routes across the western Ardennes. Roman and French cultures have at times worked northward along these passages, but more commonly have they served as routes for the invasion of France by Germanic peoples. Saxons, Franks, and others right on down to the German armies of the two world wars have used these convenient approaches to the heart of the Paris Basin. Paris lies only 111 miles from the Belgian border.

There are some mineral resources in the northern parts of the plateau, the greatest assets being the iron of Lorraine and small amounts of pe-



France: index map

troleum. The Marne-Rhine Canal provides a barge route from Nancy to the industrialized area around Lille. Sides of the Moselle and other valleys yield wine grapes.

Alsace, along the Vosges, extends to the Rhine. The fertile soils along the Rhine Valley produce tobacco, sugar beets, as well as wheat, fruits, and other crops. Agricultural industries produce cigars, sugar, beer, and wine. Vosges water is pure and therefore useful for textile industry. It is used for bleaching cotton to such an extent that the largest centralized cotton industry in continental Europe is located in southern Alsace. Colmar, Guebwiller, Thann, Mulhouse, Belfort, Remiremont, St. Die, Epinal, and many other centers are active in producing cottons. North of Mulhouse is a potash salt deposit second only to Stassfurt in importance. It could more than supply the current needs of the world, and it is prevented from wrecking the price structure of many chemicals only as a result of working agreements with the German producers.

Strasbourg lies at an important junction between the north-south Rhine route and a direct, canalized passage through Nancy to Paris. Strasbourg is the most important French port on the Rhine.

American Plateau is an old-rock region to the west of Paris Basin. An extreme tip extends westward as Brittany, which is similar to Cornwall, across the English Channel, in climate, soils, and resources. Some tin existed in ancient times along the south coast between the Vilaine and the Loire. The country is barren, and in a subdued way rugged. The interior is cattle country. Fishing is active on all coasts, St. Malo being a center for boats that go as far as Labrador. Brest is both a naval base and commercial port. Nantes, at the head of the Loire Estuary, builds ships. Laval is a textile center on the southern side of the hills of Normandy. Caen, on the north, smelts iron. Extensive deposits of rather poor iron ore exist in Normandy. The grazing lands of the hills provide a basis for an important cheese industry which is favored by cool climate. Camembert cheese originated in the vicinity of Argentan. Apples provide the famous ciders of Normandy.

Basin of Aquitaine lies in southwest France south of the Poitou Hills, west of the Central Plateau, and north of the Pyrenees. The Gate of Poitiers, between the Poitou Hills and Limousin Plateau, leads north to Paris Basin. The Gate of Carcassonne leads to the Gulf of Lions, of the Mediterranean. Most of the basin lies in the drainage of the Garonne, but the northern part drains

into the Charente. There is considerable similarity between the basins of Paris and Aquitaine geologically. Chalks and limestones surround a core of younger rock. A very considerable part of the basin of Aquitaine is covered by Recent alluvium and broad belts of young coastal deposits. Wheat and maize grow extensively on the lowlands, plums and walnuts are abundant, while vineyards cover slopes.

About one third of all the grapes grown in France come from the hinterland of Bordeaux. Medoc, Sauternes, St. Julien, Barsac, and other premium wines, as well as various wines called Bordeaux, originate in the eastern and southern parts of the basin. To the north, where the quality of wine is lower, much is converted into brandy. The city of Cognac lies on the Charente.

The coast south of the Gironde Estuary is straight, like that of Holland, and for the same reason. It is sandy to an excessive degree; so beaches are broad. Under natural conditions much of the sand was drifted eastward from the beaches as dunes, and extensive wastes existed. This territory, the Landes, is now planted to cork oak and pines, a project old enough so that it now produces commercial quantities of resin and turpentine. The sand has been "fixed" successfully. To the east is country useful for grazing sheep. Roquefort, famous for its cheese, lies south of Bordeaux in this barren territory.

Central Plateau (Massif Central) and marginal plateaus cover a large part of south-central France. The Auvergne Mountains, between the drainages of the Dordogne and Allier, rise high above the timber line. Mt. Dore attains 6,188 feet. A string of volcanic peaks to the north culminates in Puy de Dome, 4,817 feet. To the west are lower plateaus leading to Limousin. The main Massif Central lies southeast beyond the 6,096-foot Plomb du Cantal. Most of it lies at elevations of from 2,000 to 3,000 feet, but Mt. Mezenc reaches 5,755 and Mt. Lozere 5,500. The southeastern face of the high territory, toward the lower Rhone Valley, is called the Cevennes. To the north are the Forez Mountains between the Allier and the Loire, the Morvan Mountains north of the Loire, the Côte d'Or and Plateau of Langres leading to the southern end of the Vosges.

The plateaus are extensively used for grazing. About 25 per cent of all sheep and 20 per cent of all cattle in France are raised on them. Much of the territory is too high for other cereal crops, and so it produces about half the rye grown in France. There is little mineral wealth, but about a quarter of the French supply of coal comes from the margins of the plateau. Iron is mined to some extent along the southern margin, but the

best deposits are to the northeast, especially in the Morvan region. Limoges, in Limousin, has excellent clay resources and has become a leading china producer.

St. Etienne, not far southwest of Lyon, has some of the best coal. It has an important steel industry as well as textile, specializing in silk ribbons. Roanne produces cottons and woollens. Still farther north are many industrial towns, depending on Morvan iron ores originally, among which are Epinae and Le Creusot, the latter being a leading maker of guns and munitions. Coal from Commeny, north of Auvergne Mountains, supplies many surrounding towns and villages. Clermont-Ferrand has varied industries, including the making of automobile tires. Nearby Thiers produces excellent cutlery. It uses water power for grinding and polishing. The assembling of pocketknives is largely a home industry. Parts are left along roads in little bags that are taken home by peasants who are paid for combining them into the finished product.

Few parts of France are as useless as the Cevennes, a region made barren by the presence of limestone. As in the Karst region of Yugoslavia, however, many little basins exist where soils are fertile and around which the vine grows to produce many well-known Midi wines, including the delicate Rose. Sheep and goats find poor grazing over most of the Garriques, the lower and particularly barren slopes above the Mediterranean coast.

Toulouse Gateway, or Gate of Carcassonne (Col de Naurouse), separates the central plateaus from the Pyrenees. Narbonne, an ancient Mediterranean port, silted up by the fourth century A.D. A Roman road led west, across the low divide, for gold and silver from the northern slopes of the Pyrenees and for tin from Spain and Cornwall. A barge canal across the 620-foot summit of the gateway was completed in 1681, but Toulouse, its midway station, has not attained any great commercial significance in modern times. It serves as an agricultural center, but not as a serious rival of either Bordeaux or Marseille since the beginning of the Commercial Revolution.

Pyrenees slopes are wet toward the west and fairly dry and barren eastward. They descend from above the timber line through forest and into territory rather useless because of enormous deposits of coarse gravel and boulders. Potential water-power resources are hardly used, mainly because the streams are not particularly steady in flow from one season to the next and their utilization is thus either expensive or inefficient. Grazing lands and vineyards cover the more useful parts of the slopes.

Rhone Corridor, the southern end of the Lotharingian route to the North Sea, was the main avenue along which Roman culture spread north. Each winter and spring the *mistral* ("black north"), a cold wind, carries low temperatures to the Rhone delta. The Rhone is a swift stream and not as useful as the Rhine, beyond the Gate of Belfort. Its valley flats are narrow at places but in comparison with territory on either side, they provide the easiest route from the Mediterranean to northwestern and west-central Europe.

The Rhone and Rhine rise very close to each other in the vicinity of St. Gotthard Pass. The Rhine flows eastward, finally winding around northeastern Switzerland and through Lake Constance (Boden See) to a westward course that eventually reaches the southern end of the broad Rhine Valley of southwestern Germany. The Rhone, after flowing between the Pennine and Bernese Alps and entering Lake Geneva, remains an Alpine stream for many miles before it reaches the vicinity of Lyon and the Rhone Corridor. It is the Saône that continues northward the trend of the lower Rhone and thereby becomes the main river in the northern part of the Corridor. From near Lyon an easy route leads to the upper Loire. Another departs at Chalon-sur-Saône east of Côte d'Or, and the valley of the Seine is readily reached across the low Plateau of Langres. The Doubs leads to Belfort and the Rhine Valley.

Many of the oldest and most historic towns in France lie along the Rhone Corridor: Arles, Beaucaire, Nîmes, Avignon, Orange, and Lyon, to mention a few. A little coal from Alès and more from St. Etienne partially supply the needs of industry, but, aside from Lyon, there is no great amount of manufacturing along the Corridor. Vineyards flank its sides and a great variety of crops cover the small fields that crowd all flatland. Northward the extent of flatland increases, so that Burgundy, in addition to its famous wines, is a rich granary region.

Alpine slopes, east of the Rhone Corridor, are generally rugged and steep. The proportion of valley lowland is small. Chamonix vies with Swiss centers as an Alpine sports and tourist resort. Aix-les-Bains, Chambéry, Grenoble, and other places are popular vacation spots. Vineyards along the lower valleys produce many of the highest priced wines in France. Chartreuse and other famous liqueurs are products of the many monasteries that lie on the picturesque slopes of the French Alps. Sheep and goats graze over wide areas, ascending slopes as snows melt and grass sprouts in higher pastures. Home industries yield

supplemental incomes. Grenoble has developed considerable woodworking and other minor industries, and towns along the entire Isere Valley are specializing in producing cotton goods.

Mediterranean coast territory consists mainly of Provence to the east and Languedoc to the west of the Rhone. The olive flourishes on the poor soils of its hills and vineyards cover somewhat better lands. When a genus of plant lice known as *Phylloxera* threatened to kill all vines in France, it was discovered that they were unable to move from plant to plant across the sandy soils of the Rhone delta and its surroundings. This tremendously stimulated grape growing along the Mediterranean coast, and did much to save the French wine industry before the discovery was made that vines grafted on American rootstock were immune to attack. About one third of French wine comes from the Mediterranean region at present.

The Riviera lies east of Marseille. It is an especially attractive coast with mild winters. Steep slopes lead from high alps to the deep blue sea. Hills and mountains protect it from the mistral. Close to the Italian border is the small country

known as Monaco, with an area just barely under eight square miles and a population of 24,000. Except for a brief period during the French Revolution, this little principality has been independent for eight centuries. Monte Carlo, with the highest reputation in the world for honesty in gambling, provides practically all the revenue for running the government and also for maintaining one of the world's leading research centers in oceanography. Nice, Antibes, Cannes, St. Raphael, and St. Tropez are thriving resort towns and possess magnificent villas. Toulon is the main French naval base on the Mediterranean. Marseille, the leading port, will be discussed in connection with urbanization.

Arles, Nimes, and Béziers are famous for Roman buildings, historical monuments, bullfights, and other tourist attractions. The Rhone delta is rich in ancient artifacts, indicating continuous habitation since the sixth century B.C. when Greeks brought pottery, coins, and other possessions that now lie embedded in its silts. The channels toward the coast have never been particularly useful for navigation. When Crusaders left from St. Gilles, they had to work their way across several miles of marsh before reaching the Mediterranean. The



Rhone Delta city (Aiguesmortes)

Romans constructed a canal to by-pass the lower Rhone, but Marseille has a more elaborate canal today which runs through a tunnel 4.5 miles in length.

West of the delta the coast is sandy, straight, and deficient in harbors. Scenery is far less attractive than that to the east where rocks and hills plunge directly down into the Mediterranean. A narrow lowland corridor leads from Perpignan around the eastern end of the Pyrenees to Catalonia.

SWITZERLAND

With an area of 15,944 square miles, Switzerland is slightly larger than the combined areas of Massachusetts, Connecticut, and Rhode Island. Its population of 4.8 million is slightly larger than that of all New England states, but it includes some 0.36 million who are not citizens of the tiny republic. There are fewer Swiss nationals than New Englanders.

Seventy mountains culminate above 10,000 feet. Monte Rosa, in Canton Valais on the Italian border, rises to 15,217 feet, the highest point in the country. Around it are the Matterhorn and many other peaks that extend far above the snow line. Alpine icecaps and glaciers help to make the Pennine Alps the main scenic attraction of all the many Alpine ranges. Across the Rhone Valley to the north are the magnificent Bernese Alps, culminating in the 13,669-foot Jungfrau which rises above another fine group of icecaps and the famous Aletsch Glacier. A short distance to the east is the Rhone Glacier, one of the main tourist goals of the entire region.

WESTERN TRANSITION ZONE 237

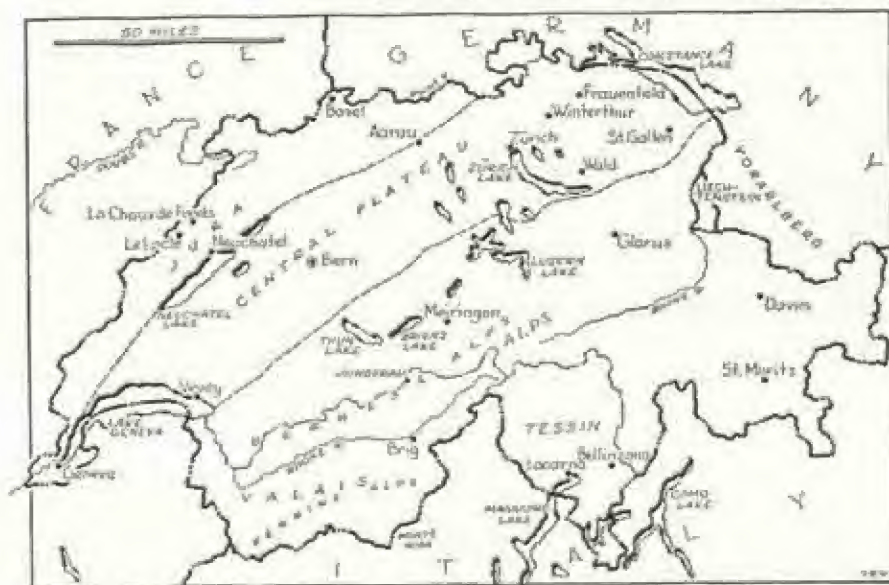
Only 30 miles east of Monte Rosa is Lake Maggiore, with an elevation only 650 feet above sea level. Its northern end extends into the Swiss Canton Tessin, where it determines the elevation of the lowest land in the mountain republic. Lake Maggiore is extremely deep, its bottom lying 575 feet below sea level. If it could be pumped dry, Switzerland would have a vertical relief of nearly 16,000 feet.

The railroad from Lake Maggiore to Bern passes through the 12.5-mile Simplon tunnel and the long Lötschen tunnel, as well as many others. The line from the lake to Zürich goes through the 9-mile St. Gotthard tunnel.

About three quarters of Switzerland drains into the Rhine. Other watersheds lead to the Rhone, Po, and Danube. There are over 20 large lakes and a tremendous number of small water bodies that tend to regulate stream discharges, so as to improve conditions for developing hydroelectric power, about one third of which has been utilized for running railroads and factories. There is no coal.

There are three main natural regions:

Alps constitute about 61 per cent of the country, covering more than its southern half. The Voralp (Forealp, Alpine Foreland) starts just south of the large lakes, Geneva, Thun, Brienz, Luzern (Lucerne), Zürich, and Constance. Fields and vineyards extend upward to pastures and forest that ultimately give way to alpine meadows and barren heights. Deep valleys not only enhance the scenery but serve also as important routes and lines of concentrated population. Only in small



Switzerland: Index map

areas do July temperatures run above 60° F. Higher elevations lie above the *snow line*, the lowest territory where snow melts completely during the summer, and are therefore below freezing during much of the summer. Winter temperatures are generally well below 32°. Spring is hastened in valleys by *föhn* winds. These are local masses of air that are heated by increased pressures encountered during descent of slopes. Air that is heavy and cold enough to flow down from higher elevations into the valleys and along their floors becomes not only relatively warm but also dry, so that it raises temperatures and melts snow. There is considerable difference in temperature on opposed valley walls. Slopes facing the south, where there is less shade and more direct sunshine, are considerably warmer than those facing the north. Population distribution and the usefulness of land depend quite largely on these factors of local climate.

Davos, St. Moritz, Meringen, Brig, and Martigny are famous resorts to the north of the main Alpine divides and Locarno, Bellinzona, and other attractive towns lie on the south, in Canton Tessin.

Central plateau, between Lakes Geneva and Constance, north of the Voralp region, covers about 27 per cent of the country and is the abode of 70 per cent of the population. In spite of the scenic attractions of the Alps and their great extent, most of the Swiss population actually lives below the 2,500-foot contour. Most of the cultivated land lies on the Swiss Plateau. Though wheat, rye, and oats are planted extensively, cereal production is not sufficient to fill all needs. Potatoes and imported wheat are necessary to round out diets. Tobacco is a cash crop, and wine, especially from the vicinities of Lakes Geneva and Neuchâtel, is a relatively important agricultural product. The leading industry, however, is dairying. Cropland is decreasing in favor of grassland and pasture. Cattle, pigs, and poultry are of prime importance in balancing the economy. Cheese, condensed milk, and chocolate products are among leading exports.

Domestic industries are highly developed, as in

many other places where agriculture is rather difficult. Among more backward peoples, as generally in Slavic territory, the effect of domestic industries is quite commonly that of reducing commerce to insignificance; but among more advanced peoples, as in Saxony or the Black Forest, they commonly lead to international trade. The Swiss have been preeminent in establishing commercial enterprises out of skills acquired at home. In the central plateau energies are devoted to textile manufacturing. A cotton district is localized in the north, around Aarau, Zürich, St. Gallen, and Winterthur. The latter city specializes in spinning. Zürich and its environs not only produce cotton and silk cloth but also manufacture textile machines. Wald produces muslins and embroideries. Glarus lies back in the Voralp where excellent water has favored cloth-printing industries. Frauenfeld is a center for brewing, canning milk, and making chocolate, as well as agricultural machinery. Bern, in addition to its role as capital, produces silks and many specialty products. Vevey and a large district toward Lake Geneva produce canned milk and wine. Switzerland has become so industrialized that it is necessary to import many Italian workers for its cotton mills.

Jura Mountains lie along the northern border of Switzerland. Folds of old rock rise to summits about 5,000 feet high between which there are longitudinal valleys paralleling the valley of the Doubs and the east-west trend of the Gate of Belfort. The Swiss Jura occupies about 12 per cent of the country. Being mainly pastureland, it is far less productive than the interior plateau region. Domestic industries long ago turned to specialization in watches and clocks. Le Locle and La Chaux-de-Fonds on the French border, Neuchâtel, and Geneva are outstanding centers of these industries. In addition, Geneva is an important producer of electrical goods. Basel, in the extreme north, is the center of the Swiss chemical and dye industry, as well as manufacturer of silks. As a Rhine port, it is the home of the Swiss Merchant Marine, which consists of ships aggregating only about 50,000 tons, a rather large fleet of river barges, and what may be considered the Swiss Navy: a gunboat or so on the Rhine.

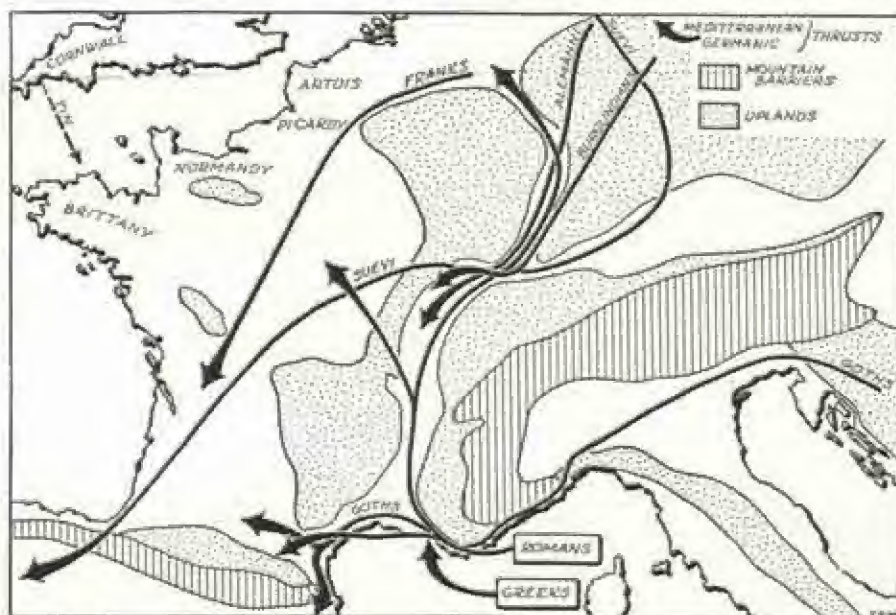
26: Cultural Succession in France and Switzerland

The early Mediterranean population of France was invaded and overwhelmed by Alpine peoples at an early date. The latter were organized tribally and were Celtic speaking. Their family and place names are extremely common in France today. The arpent and league are ancient Celtic measures of distance which have survived. The subsequent language in France was Latin, as spoken by Celts. Dolmens, huge slabs of rock placed on end with others across their tops, were erected at many points. These curious monuments are still numerous. They may indicate tombs or sites of religious significance.

An infusion of Mediterranean stock and the introduction of early Mediterranean culture date to 600 B.C. when Greeks established colonies along the coast of the Gulf of Lions. Massalia (Marseille) was probably the oldest Greek colony, but several other places also claim the distinction. In any event, little seems to have been said about the early Greek colonies in southern France, probably for commercial reasons. Fishermen seldom boast about places where rich hauls are made because others will immediately take advantage of

the information. There was similar secrecy about the source of tin, as there is today about the source of jade. Massalia appears to have been too successful as a commercial venture to be advertised to Levantines and other possible competitors. That the Greek population there and to the west was large is not only indicated by artifacts and ruins that have been excavated but also by the amount of Greek blood that has remained in the territory to this day. The women of Arles are famous for their beauty, which is essentially that of the classic Greek. Temples of Jupiter and Juno (Zeus and Hera) were erected along the Mediterranean coast and along trails leading northwestward toward Brittany and its tin.

Roman legions entered the Rhone Gate in 121 A.C. and established a colony at Narbonne (Narbo) in 118 A.C. By that time Germanic tribes were already invading France deeply, driving earlier peoples to the west and south. Eventually the Celtic-speaking people were to be confined to Brittany, much in the way that the Cornish were driven to the tip of land west of Devon, the Welsh to Wales, and the Gaels to western Ireland



France: culture thrusts

and the Highlands of Scotland. History is silent as to when and how the Basques were driven to the western end of the Pyrenees.

The first main encounter between Romans and northerners involved a tribe called the Cimbri who disputed Roman authority in the Rhone Valley in 109 B.C. These Nordics defeated the Romans at Orange in 105 B.C. After migrating into Spain and back across France to the Eastern Alps, the Cimbri returned to be crushed by the Romans in 101 B.C. at Aix between the great southern bend of the Durance and Marseille. By 58 B.C. the Romans advanced up the corridor to the junction of the Saône, where other Germanic tribes were encountered.

Roman control of most of France and the Lotharingian Corridor lasted until the fifth century A.D. A Roman variety of Mediterranean culture was thoroughly implanted in the native population. Roads were built to all focal centers. Temples were established along the way, especially on hilltops, such as Puy de Dome. Law and order were maintained. Roman justice was expected by the populace. Latin displaced Celtic tongues generally, spoken of course with a foreign accent and idiom.

CULTURE TRANSITION ZONE

The Shatter Belt, between Eastern and North-western European cultures, involves extreme and somewhat irreconcilable cultural conflicts. The



Frankish Kingdoms in 843

gaps between Slavic, Germanic, and Baltic-speaking peoples are wide culturally. Religious differences fan fires of nationalism. Intruders such as Bulgars, Magyars, Tatars, and Turks introduced exotic ways of life. Jealousies and political unrest have persisted for centuries.

The corresponding transitional zone between culture realms in western Europe finds mild expression in comparison with the Shatter Belt. The territory had been unified under Roman rule, which more than crossed it. The morals and fundamental ways of life established in France were about the same as those implanted by the Romans in territory as far east as the Rhine, and north to Holland and the borders of Scotland. The upsetting influence, invasions of Germanic-speaking peoples, affected both France and territory to the north. Religious unification under Roman Catholicism disappeared after the Reformation in some, but not all, territories to the north of the zone of transition. The Germanic-speaking peoples were ready in many instances to adopt the ways of the Mediterranean. France and Switzerland stand out as lands of blending cultures rather than of sharp and irreconcilable conflicts as in the Shatter Belt.

Roman France was invaded by Nordic Franks in rather large numbers. From the general vicinity of Aachen they spread along the Meuse-Sambre Corridor into Paris Basin. By A.D. 511, they had spread into Aquitaine, and in 536 Clovis added Provence to his domain. The Alemanni proceeded from the Elbe and Rhine valleys and, with the Suevi, entered eastern France through the Gate of Belfort. Burgundians came by the same route, and they established a kingdom in the fifth century that was conquered by the Franks in 534 but re-established between 887 and 1032. In the sixth century Visigoths were present along the Mediterranean coast west of the Rhone delta, and Ostrogoths to the east. These invading Germanic tribes had occupied country outside of the Roman Empire originally, but most of them had been in rather close touch with it and were glad to accept many Roman ways of life.

The impact of the Germanic peoples and the beginning of Europe's Dark Ages was not a sudden blight that completely stamped out old cultures and the Mediterranean civilization. Germanic tribes had long been testing the strength of the Roman frontier, and Mediterranean civilization itself had become decadent and low in vitality. A period of Dark Ages probably lay ahead, even if there had been no Nordics on the horizon. When the time for revival came, it was largely through Germanic auspices in northern Italy and France. During Holy Roman Empire

days, these people maintained the tradition of Empire, crudely but tenaciously. Under Germanic influences arose such legal codes as the British Common Law which had its basis in Roman justice. The Franks and Burgundians became Latinized readily enough. German Kings, until 1365, went regularly to Arles to be crowned as King of Burgundy. They also went to Rome to become Holy Roman Emperors.

The proto-Medieval period saw the rise of feudal states in France, as in Germany. The three great granaries and storehouses—Paris Basin, Basin of Aquitaine, and Burgundy—were always rich prizes in the conflicts between feudal states. In 843 the Treaty of Verdun established divisions that foreshadowed the establishment of modern European states. A West Frankish Kingdom included most of what became France, an East Frankish Kingdom, most of what was eventually to become Germany. The Middle Kingdom of Lothair was created between the two. By 877 this Middle Kingdom was reduced to Burgundy, the rest having been taken by the East Franks, and by 1032 it became incorporated in the Germanic Holy Roman Empire. Hugh Capet, the "first king of France," controlled little more than the Paris Basin. In 1186 the western half of what is now France passed into English hands and for about three centuries an English sovereign claimed at least some part of France. Title to the Channel Islands is the last relic of that particular phase of history. The fame of Joan of Arc resulted from driving the English from Orleans in 1429, but she was captured in the following year and executed in 1431.

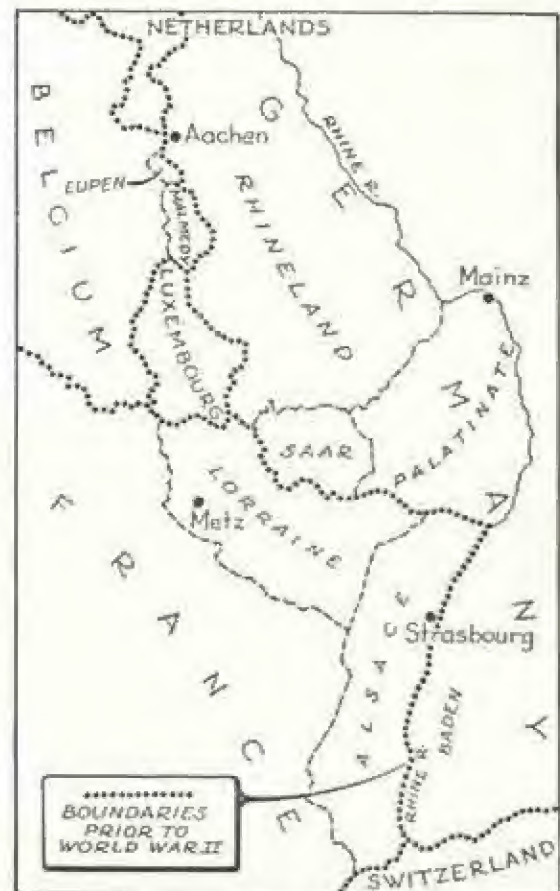
Henry IV made a fair start toward abolishing the feudal system in France after 1589. By 1651 such progress had been made in the destruction of petty states that France emerged as a nation, though the actual end of the old system had to await the Revolution, 1789–1795. Many of the provinces of France were quite autonomous until 1790 when they were abolished and the country was divided into 83 departments. The boundaries of departments were poorly drawn, so that they have never had much significance as political units, though they are in existence today.

The hold of the Roman Catholic Church in France varied with distance from the Mediterranean. In 1517, with the Reformation in Germany, Protestantism immediately started in northern France. Persecution of the separatists was general, one of the greatest waves occurring in 1572 when the St. Bartholomew's Day massacre of Huguenots took place in Paris. The Edict of Nantes in 1598 brought an ineffective halt. Hostilities were resumed in 1624, and in 1685 Louis XIV revoked

the Edict. Protestant rights to hold property and to enjoy freedom of worship were not restored until the Code of Napoleon went into effect.

France has effective boundaries on the south and west but lacks them between Dunkerque and Monaco. No difficulties have been encountered with the Swiss, and only minor troubles with the Italians. French-speaking people extend some distance across Alpine summits, but near the coast Italian-speaking people overlap into France. The most serious boundary questions have always arisen along the borders of Germany. To the French, the Rhine is the traditional boundary, but in actuality there is not a single area along the entire left bank of that river where the people use French as their native tongue. The buffer region of Lotharingia has continued as an international problem ever since the ninth century.

Alsace was given to France as a reward for assisting Germany against Austria in the Thirty Years' War. Though its people were essentially



Lotharingian Corridor states

similar to those of Baden across the Rhine, and spoke German, they were governed with greatest consideration after 1681 and gradually became enthusiastic citizens of France. This feeling was intensified after the Revolution. When Alsace was taken by Germany in 1871, there was widespread gloom and dissatisfaction among its inhabitants. The Germans engaged with fair success on a studied program of making good German citizens out of the Alsatians, but it has long been evident that the country would be happiest if it were granted independence, or affiliation with the Swiss republic. The majority of the population is German speaking, but many consider political affiliation with France a lesser evil than union with Germany.

French claims to the Palatinate (Pfalz) and the Rhineland are rather weak from either historic or cultural standpoints. The peoples of those territories on the left of the Rhine are Germans in every respect. The Saar is predominantly German. Luxembourg is hostile to affiliation of any sort and has succeeded quite well in maintaining its independence.

Lorraine is about half German speaking and half French speaking. Prior to the Franco-Prussian War it was French territory and, like Alsace, went to Germany in 1871 to be returned in 1919. To treaty makers in 1871 and 1919, the economic resources or strategic considerations were more important than the wishes of the people. The Saar has coal badly needed by France, and Lorraine has iron desired by both France and Germany. After being administered by a League of Nations commission, with France having been awarded ownership of its coal, the people of the Saar Basin voted almost ten to one in favor of being returned to Germany. Their wishes were fulfilled in 1935. It is said that Bismarck doubted the wisdom of including Metz and southern Lorraine within Germany in 1871; but the matter was decided otherwise, and a large group of French-speaking people were added to the Reich. In 1919 about an equally large number of Germans were added to France. French claims to the Palatinate and the Rhineland, however, were dismissed without much argument.

The happiest solution to Lotharingian Corridor problems occurred in Switzerland. In 1290 three German-speaking cantons around Lake Lucerne united to defend themselves against Austria. In 1353 the affiliation was extended to a total of eight cantons, all of which were Germanic in language. The Treaty of Westphalia in 1648 recognized the independence of the

state. Now there are 22 cantons, of which 16 are German speaking, 5 French speaking, and 1 Italian speaking. Some 72 per cent of the population regard German as their mother tongue, 21 per cent French, 6 per cent Italian, and 1 per cent Romansch (Rhaeto-Romanic). All four languages are official. The religious division of the small republic is about as extraordinary as the linguistic contrasts, 57 per cent of the population being Protestant, mainly Calvinist, and 41 per cent Roman Catholic.

One viewpoint regards Switzerland as not being a nation at all. The cantons have almost complete autonomy and centralized government is reduced to a minimum, so that it is a federation of cantons in a sense far more literal than exists in the United States of America with respect to the rights of individual states. Nationalism is well developed, however, among the Swiss—far more so than among the Spanish.

The possibility that Alsace or other Lotharingian states will ever become affiliated with the Swiss Republic was dimmed after World War I, when the people of Vorarlberg, the westernmost province of Austria, tried to secede and become part of Switzerland. The Swiss refused admission on two grounds; (1) the proposed Canton was so backward and poor that it would place a financial strain on the nation, and (2) it was deemed unwise to add a group of voters who were almost unanimously Roman Catholic. The first reason might not apply to other parts of the old Middle Kingdom, but the second would be a matter of great concern, especially when it is considered that Vorarlberg has an insignificant population compared with that of Alsace, Burgundy, Lorraine, or other units that might desire admission to the Swiss union.

Liechtenstein, between Switzerland and Vorarlberg, is a curious little country with an area of 65 square miles and population of less than 12,000. It remained an independent unit in the German confederation until 1866, and then became a dependency of Austria. In 1918 it declared complete independence. In 1920 it arranged with Switzerland to have that country administer its postal service, and in 1923 it joined the Swiss customs union. Government rests with a reigning prince and a legislative unit of fifteen members who are elected by popular vote. The inhabitants pay no taxes because the monarch makes an annual contribution of about \$110,000 to the treasury. A large number of corporations also pay a nominal fee for the privilege of maintaining their headquarters there in order to avoid taxes in nations where their business is actually carried on. Though it has no army, and a police

force of only 50, the country managed to escape being drawn into World Wars I or II.

The culture transition zone of western Europe emerged in modern times as mainly the two nations, France and Switzerland. Germany, Austria, and Italy have been rather well confined to territories to the east. Germany is predominantly a country in the culture realm of Northwestern Europe, and Italy is almost entirely in the Mediterranean realm. Austria is partially northwestern European but laps over into the Shatter Belt toward its eastern border. Iberia is wholly Mediterranean. Belgium is mainly northwestern European, but to some degree shares transitional qualities with France. Its Roman Catholicism and bilinguality are evidence of Mediterranean influence. To France has gone much of the buffer territory between early Latin and Germanic cultures along the Lotharingian Corridor.

Though diverse elements are grouped together in both France and Switzerland, each is a highly nationalistic state with proud and patriotic citizens. Composite as their population groups may be, each ranks as one of the most coherent nations in Europe. The racial medley in France consists of a predominantly Mediterranean population in all lowlands south of the Paris Basin; a predominantly Alpine population in the Central and other plateaus, along the borders of the Alps, and in Brittany; and a predominantly Nordic population in the Paris Basin and northern France. The Nordic element includes not only the older peoples, such as Franks, but a rather heavy tenth century influx of Norsemen who settled along the Seine estuary and spread into Normandy, Picardy, and Artois. The predominant racial group in Switzerland is Alpine, but Nordics are fairly numerous.

The linguistic variety in France includes not only the two main variants of French, *langue d'oïl* and *langue d'oc*, but also Catalan, Provençal, and Italian along the Mediterranean coast, and Walloon in the industrialized territory around Lille. In addition to these Romanic tongues are Flemish along a small part of the North Sea coast, German along a wide strip between Switzerland and Belgium, Basque in the extreme southwest, and Breton in Brittany. The official linguistic variety in Switzerland consists of three minority Romanic and one majority Germanic tongues.

It has been suggested that the extreme tolerance toward peoples of all kinds in France is a product of the diversity of the French population. There is practically no color line. The darkest-skinned Senegalese officers may accompany the fairest blondes on the streets of Paris. French colonials mix with natives with freedom and

intimacy unknown to British or northwestern Europeans generally. The persecuted or unhappy in most other lands find welcome and independence in French territory.

CULTURAL LANDSCAPES

In the nineteenth century France was described as a land of small peasant-shopkeepers. It has remained just that. Peasants still make up about one half of the population and own three quarters of the land in more than 5 million family units. About 73 per cent of the land is used for crops or pasture, 18.5 per cent is in forest, and only 8.5 per cent waste. The latter contains some of the most magnificent scenery on earth.

Rural population density is far less than that in most western European countries. The only areas that average above 250 per square mile are western Brittany, the Germanic part of Lorraine, Alsace, territory near Lyon, the vicinity of Nice, and parts of Bas Rhone in the vicinity of Marseille. To include areas where rural population exceeds 180 per square mile, it is only necessary to add a strip in the northwest extending approximately from Nantes to St. Michel, some territory around Bordeaux, and the Mediterranean coast from Narbonne to the Rhone.

The average farm in France covers 24 acres, large by standards in the Low Countries but small by British or American standards. To avoid excessive subdivision of farm holdings, families are kept to one child by the great majority of peasants. There is thus little incentive for rural populations to migrate to cities and accelerate the urbanization process so characteristic of northwestern Europe. Though villages are fairly numerous, a large number of property owners live on their farms. The position of the peasant is one of dignity, and ordinarily he lives very comfortably.

Wheat, the major cereal crop, normally requires about 22 per cent of all plowed land. The total harvest is about twice that of Germany and over half again as much as Italy, or about one quarter of all European wheat west of the Soviet Union. Though the aggregate is large, the yield is rather low per acre, about two thirds that of English wheat land, because agricultural methods are conservative and backward. The Paris Basin is the greatest single wheat-raising district. To the northwest are the wetter lands that raise oats. About 14 per cent of all plowed land is used by that crop. Potatoes occupy about 6 per cent of French land.

The vineyards of France produce from one half to one billion gallons of wine each year. The annual export is from 30 to 50 million gallons, but the import is about three times that much, chiefly from Algeria and Spain. The average consumption is nearly one pint a day per man, woman, and child or about a glass per meal, ordinarily diluted with water.

The fisheries of France rank next to Great Britain among European nations, but are inadequate to meet the needs of the greatest fish-consuming nation in Europe. Imports come mainly from Great Britain, Iceland, and Norway.

Though France has the greatest iron reserves of any European nation west of the Soviet Union, it lags behind several others industrially because of a shortage of coal and manpower. Iron is heavy and coal is relatively light and bulky. Much coal is needed to process a small amount of iron. For these reasons the centers of heavy industry lie where the coal is cheap, not iron. It is more economical to send Lorraine ore to the German Ruhr than Ruhr coal to Lorraine. Since there is no point in leaving ore barges or trains empty, however, some coal is returned to iron centers; but the industry thereby made possible is minor in comparison with that where coal is mined.

Lille, St. Etienne, and other French sources of coal are industrialized. The Saar coal obtained between 1919 and 1935 was not especially useful to France because it has poor coking qualities and therefore is not desirable in making steel. Abundant hydroelectric resources have been in part utilized, especially by railroads and textile industry along the Isere Valley east of Lyon. Some aluminum is processed by electricity. Potash salts in Alsace and common salt and lime along the Mediterranean coast have promoted chemical industries. The main industrial output of France, however, is either agricultural or a result of the activities of small factories, making luxury wares and other high-priced goods.

France suffers in many ways commercially. The compactness of the country makes it easy to by-pass. Goods exchanged between Great Britain and Germany or other northwestern European states readily find routes to the north of France. British-Iberian trade goes by steamer to the west. German or Swiss and Italian trade skirts the eastern border just beyond the Alps. Unwise and troublesome customs regulations, endless red tape, and other artificial obstacles encourage shippers to avoid France, so that goods sent from Great Britain to Italy are more likely to be routed around the country than directly through it.

The interior communications are excellent, but

self-centered. France lacks an international river, such as the Rhine or Danube. The Moselle is the closest approach but has relatively little commerce. Most of the main rivers lie either wholly in France or, as in the case of the Rhone, are not navigable beyond the frontier. In all there are somewhat more than 7,500 miles of navigable rivers and over 3,000 miles of canals, but they are almost wholly for internal use. The heaviest traffic is along the Seine to Rouen and Le Havre, and along the Oise to Calais. The Marne-Rhone Canal from



France; navigable waterways

Strasbourg through Nancy and Reims to the Oise is far more used than any of the canals to the south, such as the Rhone-Rhine Canal; Canal du Centre, the canal from Chalon-sur-Saone to the Loire; or Canal du Midi, leading through the Gate of Carcassonne.

There are over 26,000 miles of railroad radiating almost entirely from Paris. The heaviest traffic is along the lines to Marseille, Bordeaux, Calais, Lille, and the Meuse-Sambre Corridor to Aachen and Cologne. Much less traffic crosses the long eastern boundary than the comparatively short frontier to western Belgium. The national highways of France are about as extensive as the railroads and follow the same general pattern.

Paris so dominates France that practically all of the internal communications systems are designed to serve it. Canals are kept busy bringing coal to the great conurbation, or in transporting goods to and from its outports or industrial satellites. Trains are run chiefly to haul people and goods to and from the capital.

In order of commercial importance the leading seaports of France are: Rouen, Marseille, Le Havre, Bordeaux, and Dunkerque. Three of these are outports of Paris. Only Bordeaux approaches

effective independence from Parisian trade. Marseille occupies a somewhat intermediate position, serving both Paris and other parts of the country. It is the gateway to Algeria.

About 80 per cent of the imports of France are bulky commodities, such as coal, cotton, iron, and food. About 80 per cent of the exports are expensive things such as silks, perfumes, works of art, and wine. A whole cargo of Argentine beef or wheat cannot be exchanged for one of perfumes or silks. Ships are likely to have difficulty in finding return cargoes and therefore feel more secure in sailing directly to some entrepôt, such as London or Antwerp, where a return cargo is assured. For this reason the ports of France are unable to compete with the main entrepôts of nearby countries, and French commerce suffers accordingly. Extra loading and transfer charges are assessed on goods sent to or received indirectly from France. Export of luxury goods is at a serious disadvantage when other nations are suffering from depression or other causes of reduced purchasing power. French commerce prospers generally in periods of good times, but it



Roman ruin (St. Remi)

suffers more severely than that of other countries when times are bad.

The tourist income of France is an important item in balancing economy. The works of man, from crude Ice Age drawings of animals on the walls of caves to the marvelous chateaux and public buildings of recent centuries, attract those who are interested in antiquities and arts. Such cathedrals as exist in Paris, Amiens, Reims, Chartres, Poitiers, Arles, or Strasbourg, outstanding buildings in Paris, Abbeville, Nantes, Tours, Orleans, Avignon, or Bordeaux, and Roman structures in St. Remy, Arles, Nimes, or Béziers merit the inspection and amazement of thousands of persons annually. Some 1,300 hot springs in practically all parts of the country, many of which have been developed into attractive spas, nearly a thousand bathing resorts along 1,900 miles of coast, and various alpine attractions are vacation centers for multitudes of foreigners as well as Frenchmen. The foreign population in France is normally much greater than that in any other nation. Many come for a few days only, but a large number remain indefinitely. An increasing number of Italians appear seasonally as agricultural laborers in both France and Switzerland or to reside permanently in industrial centers.

URBANIZATION

France, like most Mediterranean lands, has had several important cities for centuries but has not experienced the phenomenal urbanization during the nineteenth and twentieth centuries that has been characteristic of England, Germany, the United States, and various other nations, including the Soviet Union within recent decades. Only one city exceeds 1 million, two others 0.5 million, and, in all, only seven have populations above 200,000.

Paris, with 2.8 million in the city and 4.9 within the generous limits of the "greater" conurbation, is the one giant city. Like London, it occupies a central position in a rich agricultural area and is a bridge site. Its importance as a political center dates from 987 when Hugh Capet recognized the advantages of a small island just below the influx of the Marne. Culturally it is the hub of the country, but geographically it is off center. The distance to the Mediterranean coast is 400 miles, while that to the Channel coast is less than 100, and the Belgian frontier is not much farther. Orleans, a more important capital until the close of the twelfth century, might have served well as a modern political center. Vichy, a spa supplied

with many hotels, was pressed into political service during World War II.

Though primarily important as a political, financial, and cultural center, Paris is the commercial nucleus of France and engages in a wide variety of industries. Clothing, ornamental and expensive merchandise, books, and such manufacturing as a huge city demands are its principal industries. Calais, Boulogne, Le Havre, and Cherbourg are essentially its outports. Dunkerque and Rouen could be important centers without Paris. The Seine is navigable as far as Rouen by steamers of fair size, and small vessels can reach Paris.

Marseille, 0.636 million, carries on a large trade with Algeria and other points around the Mediterranean. Its commercial significance rose sharply with the opening of the Suez Canal in 1869. The canal to the Rhone helps to centralize its trade. Good rail connections to London brought English mail for the Far East after 1916 when Brindisi was abandoned as the point of transfer from train to steamer. Industries include oil, candle, and soap making. Originally olive oil was the principal source of fat for these activities, but now they depend heavily on copra, peanuts, linseed, and sesame, imported mainly from India. Coal and iron imports have established some heavy industry, including shipbuilding. Toulon to the east is the leading French naval base on the Mediterranean coast.

Lyon, 0.461, a focal center of routes in southeastern France, is an industrial city. Nearby coal and iron supply metal industries, but the main activities are textiles and the making of textile machines. Originally the silk center of France, it has turned to synthetics and to dyeing and finishing of textiles. Most of the cloth itself is now made in smaller places along the valley of the Isere.

Lille, 0.189, is supplemented by many other cities and towns in the industrial district of Walloon-speaking France. This district is a direct continuation of the Belgian industrial hive. Iron and steel machinery and textiles, mainly cotton and flax, are produced not only in Lille but also in Robaix, Valenciennes, and other centers.

Bordeaux, 0.254 is primarily a wine-shipping port but has many agricultural industries, such as sugar refining, making of fertilizers, bottling works, and flour milling. Pauillac serves as its outport.

Nice, 0.211, is a resort center but carries on agricultural manufacturing, its specialty being perfumes.

Toulouse, 0.264, is also engaged in agricultural activities.

Only Marseille shows the rapid urbanization

characteristic of northwestern Europe within the last quarter century, as Table 17 indicates.

POPULATION DEFICIENCY

In contrast with such nations as Italy, Norway, or even Germany and England, the population of France has not grown fast enough to maintain the country as a great power. For many centuries

Table 17 Populations of leading French cities, 1911-1936.

	(millions)	
	1911	1936
Paris	2.888	2.829
Marseille	.551	.914
Lyon	.524	.571
Bordeaux	.262	.258
Lille	.218	.201

France was a cultural and military leader among western European nations. It amassed a colonial empire that once included a large share of North America and other continents, but it lost New France to the British in 1763, sold Louisiana to the United States in 1803, and gave up control of a fair share of India. The colonies retained, however, have an area of 4.6 million square miles (British Empire, 13.0), and a population of 77.8 million (British Empire, 610.8). This colonial load is not particularly productive, and France is no longer able to finance or manage it.

The population of France is about stationary.

Table 18 Population and area of France, 1906-1946.

Census Year	Area (thousands, sq. mi.)	Population (millions)	Density (per sq. mi.)
1906	207.0	39.25	189
1911	207.0	39.60	191
1921	212.7	39.21	184
1931	212.7	41.83	196
1936	212.7	41.91	197
1946	212.9	41.00	192

During World War I the loss in persons killed amounted to 1.5 million. The decline in manpower was so great that France was hardly able to take an active part in World War II. An expenditure of \$500 million in a line of fortifications, the Maginot Line, turned out to be an extremely unwise undertaking, and military resistance collapsed promptly when these defenses were breached.

The population increase shown during the early 1930's was mainly due to an influx of foreigners. Belgians and Poles moved into the industrial centers of northern France in large numbers and Italians to the Mediterranean coast. Some 1.5 million foreigners are included in the census returns of 1936.

To attribute the inability of France to keep abreast industrially with nations of northwestern Europe to lack of coal and fuel resources is hardly more valid than to attribute the backwardness of Poland to an insufficient sea coast. Switzerland has managed to do well without either coal or coast. Zurich, its leading industrial city, has a population of one third of a million. Czechoslovakia, of course, demonstrated the possibility of industrial prowess without either a sea coast or great abundance of coal. The difficulty faced by France industrially is primarily lack of manpower. One-child peasant families fail to provide a reserve, such as exists in the rural populations of other important nations. The land of small peasant-shopkeepers remains culturally Mediterranean and has lagged behind its northwestern European neighbors in the Industrial Revolution. Its cultural landscapes have suffered far less change during the past century than those of neighboring lands toward the north and east.

FRENCH BARBARY

The most successful penetration of European World culture into the Dry World, save for that taking place in the Soviet Union, is occurring along the African shores of the Roman Sea, the western coast of Barbary, especially in Algeria.

The northern territory of Algeria has an area of somewhat over 80 thousand square miles, divided into three departments: Algiers, Oran, and Constantine, with a combined population of 8.7 million. About 850,000 people are regarded as French. The absence of prejudice against marriage with peoples with different racial, linguistic, or cultural backgrounds is resulting in considerable mixed French-Arab and French-Berber populations. The growth of these groups contrasts sharply with the stable condition of the population in France itself.

The climate of coastal Algeria is not much different from that of the southern coast of France. Leading agricultural products include wheat, barley, oats, maize, potatoes, artichokes, tobacco, flax, olives, and wine. Coastal lowlands and terraces are fertile and productive. A large export of wine, cereals, olive oil, and alfalfa hay goes to Marseille. Considerable mineral wealth exists, including iron, zinc, lead, mercury, antimony, and copper. While commercial progress has been rapid during recent decades, there is little industrial development as yet. Algiers (Alger), the principal port, has a population of 315,000.

Morocco to the west and Tunisia to the east

are both French protectorates. The former came under French rule only in 1912 and was not completely pacified until 1933. It has not undergone any notable Europeanization except in a few cities, especially Casablanca—its main Atlantic seaport of 570,000. Tunisia has been under French rule since 1881 when it was occupied to prevent frequent raids on Algeria. Of a total population of 2.6 million, only 108,000 are French. Tunis, the capital, has a population of 220,000 and is the main center of European influence. The most striking thing about its European population is the great number of Italian settlers, who slightly outnumber the French. The products of coastal Tunisia are similar to those of Algeria, and the mineral resources include lead, iron, zinc,

and phosphates, the latter being an extremely important source of fertilizers.

In all, there are about 1.2 million French in Morocco, Algeria, and Tunisia. Aside from European settlers in South Africa, this is the largest "white" population group established on the Dark Continent. The Algerians are citizens of France itself and their influence in French affairs is very likely destined to increase in importance as time goes on. Paris will lie far from the center of French influence if present trends continue and the western Mediterranean, the old Roman Sea, becomes a French lake. As transitional territory, France has traditionally separated Latin from Teuton, but in the future, to an increasing degree the nation promises to stand as one of the main bulwarks separating the European from the Dry World.

DRY WORLD

DRY WORLD AND DRYLANDS
IN ARIZONA
BY DR. J. H. HARRIS

27: Physical Background

To the south of the European World, climates are too dry for field agriculture, natural resources are too meager for widespread industrial and technological development, and the possibilities of food supply are too limited to support more than an extremely sparse population, except in a few favored places. To Europeans this is strange territory, inhabited by utterly alien peoples, with inexplicable mental reactions and outlandish customs. In the Dry World nature is niggardly in providing the essentials of life, physical environments test the powers of human endurance severely, and death may be the consequence of inexpert use of such resources as exist. If nature is harsh, man is even more tyrannical. Lust, greed, and vengeance are commonly his compelling motives. Much of the Dry World is *balad-al-khuf*, the Saharan expression for a "country of fear," fear of the lurking robber band, fear of the fanatic of a different religious sect, fear lest one's brother murder him during the night so as to possess the entire caravan, as well as fear that the distant waterhole has been poisoned or defiled, making death certain within the next few days.

Many recognize such concepts as the "Moslem World," "Arab World," or "World of the Turk," but culturally there is unity that extends more widely, a Dry World, that embraces practically all of the arid territory of the Afro-Eurasian landmass in the northern hemisphere. Whether the religionist be a fanatical Mohammedan or equally fanatical Buddhist makes relatively little difference to the European. The things that separate the European World from the territories to its south are utterly different ways of life: pastoral nomadism over most of the surface, dependence of man on animal for sustenance, dependence of animal on the scantiest of natural vegetation, extreme contrast between areas supplied with small amounts of water and those that are not, fetters of taboos, contrasts in moral codes, tribal political organization with little regard for political boundaries, and the low value placed on the life of an individual. It matters little whether the watchman is perched in a tower, as in ancient Tarim, or rides ahead of the caravan in the protection of sheltering sand dunes to climb stealthily up the lee

of a crest to peer cautiously over the top to see whether an enemy is lurking along the trail, as in contemporary Arabia, each is an expression of Dry World culture. The Mongoloid Turki could adjust himself to the ways of the western Saharan Tuareg rather easily, as compared with the difficulty a European might experience in trying to become a member of either community.

LOCATION

Culturally the Dry World is bounded on the north by the European World and its Siberian Wedge. Its African part is bounded southward by the African World of the Negro. Its Asian part extends southward to the Oriental World of India and China.

Geographically the western boundary is the Atlantic coast of Africa as far south as the Senegal. A portion of the Mediterranean coastal lands, included in the Arabian concept "Maghreb" which included Spain as well as the better-watered lands north of the Atlas, is transitional territory into the European World. In general, along the Barbary States of Morocco, Algeria, Tunisia, and Tripolitania the cities and their immediate hinterlands are Europeanized and the back-country is Dry World. The Dry World extends to the Mediterranean without serious interruption from the Gulf of Gabes to the Gulf of Sidra and eastward of Cyrenaica. A narrow belt of transitional territory or European urban outposts occur here and there along the Levantine and Anatolian coasts, but the interior of Asia Minor is Dry World territory. The transitional zone widens in the Soviet Union, but most of the area south of a line extending from the western end of the Caucasus, through the Manych Depression, to the southern end of the Urals is culturally Dry World. In a very rough sort of way the northern boundary falls along the southern side of the Siberian Plateau of central Asia, extending to the northern end of the Great Khingan. The drainage basins of the great northward-flowing rivers generally lie within the European World, while the arid basins of the interior belong to the Dry World.

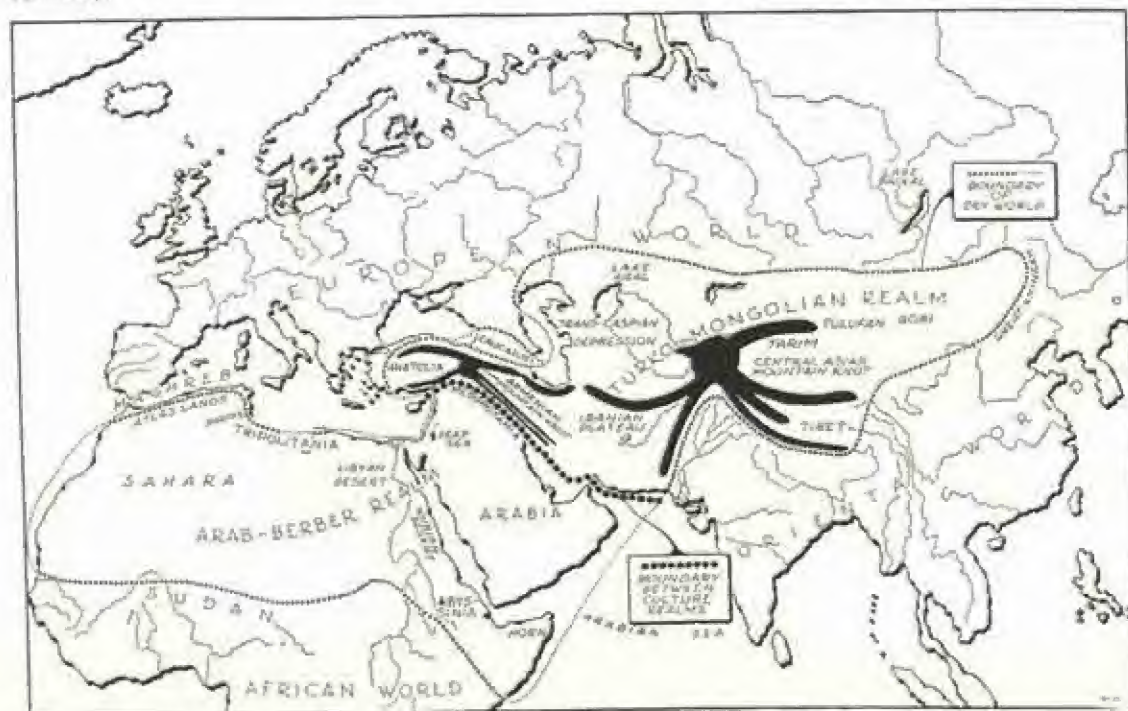
The southern boundary in Africa extends east-

ward along the northern part of the Sudan to about Khartoum, at the junction of the Blue and White Niles, then turns southeastward to the Abyssinian Plateau, which it skirts, turning southward, past Lake Rudolf, reaching the Indian Ocean south of the Horn of Africa not far south of the mouth of the Juba River. Eastward, the Dry World extends along the shores of the Arabian Sea to near the mouth of the Indus, where its transitional border turns north along the Kirthar and Sulaiman ranges and toward the southern part of the Pamir Plateau. It then follows the southern and eastern borders of the Plateau of Tibet, passing close to Lanchow, and from thence northeastward to the Great Khingan.

More significant than these external limits, which are always more or less transitional and therefore subject to various interpretations, are the core or nuclear areas of the Dry World. Its real heart includes the Sahara, Libyan, and Nubian (Arabian) deserts in Africa. In Asia it covers most of the Arabian, Anatolian, and Iranian plateaus, the low trans-Caspian depression of Russian Turkestan, with its Kara Kum and Kyzyl Kum nuclei, the extremely high Plateau of Tibet, the basin of Tarim, with its Takla Makan, and the basins of Mongolia, with the Desert of Gobi (Shamo).

Aridity is the main unifying characteristic of the Dry World. The heart areas ordinarily receive less than four inches of precipitation annually. Outer borders of transitional territory may receive three or four times as much, higher values generally occurring in warmer regions, as through the Sudan, south of the Sahara.

Air is dry. The amount of moisture contained within any volumetric unit, such as a cubic foot, is likely to range somewhere between the minimum present at any time along the Atlantic States of the United States to less than one sixteenth of that amount (*absolute humidity* of from 0.4 to 1.5 grains per cubic foot is characteristic). In relation to the capacity of air to hold water, *relative humidity*, the moisture present is commonly below 5 per cent and in monthly averages rarely rises much above 25 per cent. Vapor pressure is low, so that evaporation rates are ordinarily extreme. Moisture-starved air dries out everything in contact with it. Humid-climate plants would wither immediately if exposed to it. Pieces of wood become light and brittle. During the heat of summer, when evaporation is most intense, the lakes of interior Asia lower at rates such as three feet per month. Water in canvas bags is kept cool under the hottest sun, by the effect of evaporation, an action similar to that of



Dry World: Index map

alcohol placed on human skin in more humid climates.

The dryness of the atmosphere is a product of many causes, which cannot be examined in detail here. In general it is difficult for maritime air-masses to reach the territory of the Dry World. In interior Asia the reason is mainly that of great distance, assisted by mountain barriers. In Africa this effect is enhanced by position in a "high-pressure belt," where for reasons of equatorial heating, earth-rotation, and earth-sphericity, there is a surplus of air at high altitudes which is relieved by descent. In high-pressure regions air comes to the ground and then flows away horizontally, as wind. It carries little moisture initially and because subsidence, or lowering toward the surface, heats air, capacity to hold water increases, and relative humidity drops accordingly.

No region is absolutely rainless or devoid of precipitation. There are times when even the most sheltered and remote basins in Asia come under the influence of maritime air-masses, but they are infrequent. At Cairo, which is practically on the coast of the Mediterranean and not far from the Red Sea, fewer than half of all years experience even a trace of precipitation. The entire interval from 1909 to 1916 was rainless.

Contrary to ordinary belief, it practically never rains long and violently in deserts. Wet territory receives the most precipitation per year and also

the greatest quantities on individual days, or during individual hours, or intervals of any other kind. In the southeastern United States it is not uncommon for places to experience over ten inches per day and some have received more than double that amount. In parts of the wet tropics the records rise four and five times as high. In deserts such rainfalls are unknown. It is not only difficult for air sufficiently moist to cause rainfall to reach deserts at all, but also quite impossible that enough moisture be brought to form a cloud-burst or anything approaching it.

To deny heavy precipitation is not to deny severe floods, nor widespread effects of water erosion. These, paradoxically, are characteristic of even the driest deserts. No sandstorm has ever killed a person, but death by drowning is fairly common in the Sahara and other deserts. Only the ignorant ever camp in a stream bed or water-course of any kind, however dry it may be and however clear the sky. Official parties, such as patrols of soldiers, are strictly forbidden to do so. There are more miles of protective levees in the Colorado Desert of the American Southwest than along the Mississippi River. When railroad traffic between New Orleans and California is halted by wash-outs, the site of trouble is almost always in the desert. The flooding in deserts is



African Mediterranean city, Oran (U.S. Army photograph)

caused by rapid run-off. There is little vegetation or soil to hold surface waters. Rainfall is soon concentrated along watercourses and these are likely to be steep, so flow is rapid. A stream bed dry for many years may suddenly accommodate a flow several feet deep, which arrives with an almost perpendicular front, even though less than one half inch of rain has fallen. On January 17th, 1919, there were boats in the streets of Cairo, houses in poor quarters crumbled as if made of sugar, and street cars were submerged to their windows, all because of a rainfall of less than two inches, an amount that would be rather inconsequential and do no harm whatever along the Gulf Coast or generally over the southeastern United States. Every Saharan oasis has suffered severely from floods at some time or other, mainly because of mud or dried-brick house construction. Nogales and other places in the American Southwest have been scenes of disaster from drowning many times.

Deserts are windy places. Warm or hot days normally cause small dust devils, or whirlwinds a few feet in diameter. Winds normally rush toward mountains and uplands during the afternoon, to return, possibly with some violence in the dark of the morning. Larger windstorms are comparatively common. The *sirocco* (Algeria), *harmattan*, *simoon*, *khamisin* (Egypt), and *shahh* (Saharan "south wind") are all-too-common, severe winds. In Asia are *burans*, which may be icy cold, in winter. The *kara-buran* (black storm) is heavily laden with dust while the *sarik-buran* brings only yellowish skies. The *sirocco* carries dust as far as Europe. The *khamisin* transports it to and past Egypt. While extremely unpleasant, these parching, dry, and sometimes sand- or dust-filled winds are not fatal, nor do they bury caravans, or cause other disasters commonly attributed to them. In the immediate vicinities of dry and unpacked sand they produce *sand-blast*, which burns the skin and wears away fixed objects, but only within a yard or so of the ground. The major dust storms occur in the steppes and more humid sides of the dry regions, where fields are plowed, or animals trample the ground in considerable numbers. Most desert surfaces are swept so clean by wind that little dust or sand is available to rise. The great dust storms in the United States are in the steppes of Texas, rather than in southwestern Arizona, where real desert exists. Those of the Sahara occur mainly toward the Sudan or Egypt. Ancient carvings and rock paintings in the Sahara are as fresh today as when made, many tens of centuries ago.

On clear days the *mirage* is a welcome atmospheric phenomenon to desert travelers, because it permits them to see objects beyond the horizon. It always appears in the sky and is caused by the reflection of light waves along a contact boundary between local air-masses of differing temperature, therefore of differing density. Objects always appear inverted in mirages. *Looming*, on the other hand, which many people confuse with mirage, is a nuisance. It is the effect of reflection from a layer very close to the ground and cuts down visibility. It may be seen on hot days along paved roads in practically all climates. In the steppe or desert looming may produce the illusion of lakes in which distant objects are reflected. Many uninitiated parties probably perished in crossing the Great Plains of the United States as a result of such deception. Supposed bodies of water drew away as fast as covered wagons or scouting parties advanced.

Temperature is a matter of secondary importance in the Dry World. Arid regions are subject to extreme daily ranges. Not rarely nights with freezing temperatures alternate with afternoons on which the thermometer registers above 80° F., or even up to 100° F. Clear skies permit both rapid radiation and effective transmission of insolation. The ground surface itself gets extremely hot, temperatures in excess of 150° F. being common and 180° F. not rare. A man with shoes readily stalks the gazelle or hare in the afternoon. Life generally grows somnolent during the hotter parts of the day. Night is the time for summer caravan travel and grazing. Animals seek the shade of vegetation, rocks, or burrows during the day. The sands of the desert are generally delightfully cool, even after the hottest summer days, not long after sunset.

Seasonal temperature contrasts depend on latitude and continentality. The northeastern extremity of the Dry World lies not far from the part of Siberia that holds the January-July range record. Winter months are bitterly cold, averaging many degrees below 0° F. Aside from a foggy border along the west coast of North Africa, the southern Sahara is always too warm, by European standards.

From a cultural standpoint the most significant temperature boundary in the Dry World is the isotherm of January 32° F. On the warm side of that line, men need give but little attention to the rigors of winter, the date palm is the common food provider and tree of the oasis, and Arabic is the almost universal tongue. On the cold side, life is adjusted to the recurring season of cold, the fruitless willow and poplar are the typical oasis trees, and languages are almost entirely non-

Semitic. The association of a language contrast with an isotherm, of course, is wholly a secondary matter. The real significance of the association is simply that Turkish and Mongoloid peoples have not been particularly successful in pushing their control into the warmer parts of the Dry World, nor have the Semites succeeded in driving into the region of cold winters.

The individual climates in the Dry World range from the extreme deserts, with cold-winter varieties north of Mesopotamia and warm-winter varieties southward through Syria and Arabia and westward across Africa, through steppes into various kinds of humid climates. The season of maximum precipitation is the cool season in the western and northern Sahara and the steppe leading to Mediterranean climate. Elsewhere, summer is the wetter season.

VEGETATION

There are areas of shifting sand fields, *erg*, and areas of absolutely barren rock where no plants live. These constitute rather small fractions of even the deserts. In general, deserts are places where vegetation is impoverished and highly specialized, where grass cannot grow, and where grazing is extremely poor. Steppes are places where the vegetation is somewhat more abundant, plants somewhat less modified to withstand aridity, and where short grass exists, so that grazing is relatively good. The grass is taller and plant life more and more diversified toward humid borders of the dry climates.

Aside from barren, stony ground and saline flats, desert soils are normally fertile and become highly productive wherever water can be supplied to plants. The contrasts between oasis and unproductive desert are line-sharp, depending on the outer limit of water supply. The peculiar modifications in plant life that exist in the desert are concerned with conserving moisture rather than adaptations to temperature conditions.

The typical plants of driest regions are *xerophytes*, which are ordinarily deep-rooted and small statured. By far the greater part of the plant is below the surface. The experienced desert traveler soon has a campfire going amid what appear to be barren surroundings, because he knows that the roots of many plants are available in large volumes to furnish excellent fuel. Hugging the ground preserves moisture. Small leaves, often reduced to thorny tips, or no leaves other than thin scales, also cut evaporation losses. Gray color reflects sunlight and prevents undue heating. Chlorophyll is commonly contained in fleshy branches. Tissues are modified to retain moisture.

Many annual plants have extremely short life-cycles. After a slight wetting, their seeds, which are able to remain viable through many years of drought, germinate, so that plants vegetate, blossom, and mature in a matter of a few days. The *ashab*, or general cover of rapidly growing plants bursts suddenly into bloom. Camels and other animals enjoy its tender stems and leaves, but the feast is short. A few days of withering heat destroys the crop. Seeds survive, firmly protected by cases that withstand drought. A new *ashab* appears when the next rains fall at an appropriate season, even though many years elapse between one crop and the next.

Shrubs grow higher and are spaced more closely as uplands are ascended or steppe climates are approached. Tamarisks, *acacias*, and other small-leaved trees are typical of the transition to more humid climates.

The Dry World is by no means barren of *hydrophytes*, or water-loving plants. Here and there, patches of wet ground occur where typical marsh vegetation thrives. Sedges, cattails, reeds, and other grasses grow in such places. Even in remote Tarim, reeds twenty-five feet in height and two inches in diameter grow thickly where water is locally abundant, as around the borders of lakes. Shore birds are by no means novel in the desert, though their distribution is sharply localized. *Gallery forests* flank the sides of streams, comprising such trees as willow and poplar. These extend as narrow fingers projecting hundreds of miles beyond normal forest limits toward the dry hearts of Asia and northern Africa.

The most elevated parts of the Dry World, Tibet and other high parts of Asia, exhibit widespread development of Alpine tundra, the plant assemblage being very similar to that of the inhabited parts of the Polar World.

ANIMAL LIFE

Among the larger animals of the desert the antelope is most abundant. Fleet of foot, he is able to range widely where grazing is poor. Some types, such as the *adax* of the Sahara, are able to store large amounts of water in the manner of the camel. Native peoples, on killing either antelope or camel, eagerly collect and drink large amounts of greenish fluid found in their entrails. The antelope is present throughout the Dry World, and in considerable variety, from the fleet gazelle to the majestic *adax*.

The one-humped dromedary of southwestern Asia and the two-humped camel of inner Asia

occur both in wild and domestic forms. The dromedary is a comparatively recent introduction in Africa.

Mountain sheep, yak, wild ass, and other herbivores become abundant toward the steppes of Asia. The steppes of Africa are ranged over by giraffe, elephant, rhinoceros, buffalo, and other big game. The wild pig gets far into the dry regions, along the gallery forests, and is among the more common larger animals of Asian steppes and deserts. The jackal, wolf, fox, and other carnivores accompany the larger grazing and browsing animals. The Bengal tiger once roamed the dry basins of inner Asia, but is now practically gone. Of rodents, the hare is the largest and most valuable for food. Reptiles are present in considerable variety, especially lizards. The Indian cobra of southern Algeria is an unwelcome intruder who migrated north from the tropics during the Ice Age, when the Sahara was somewhat better-watered. Fish of many varieties inhabit streams, unmindful of the aridity of air above. Some, however, are specially adapted for survival in moist mud, where they remain immobile until waters rise. The catfish and a small tropical fish (*Chromys*) found their way to several Saharan oases during the Ice Age, along with the crocodile and cobra. Beetles, mosquitoes, and other insects are present universally, the fly being the worst animal and human tormentor of all.

Oxen, including the humped zebu, horses of various kinds, and camels are the typical pack and burden animals of the desert. The yak is particularly adapted to the higher parts of Asia and is the mainstay in parts of Tibet. Camels, sheep, and goats provide meat and milk. Milk camels have a market value of only from one quarter to one half that of riding camels but their importance in desert economy is like that of the reindeer to Polar World peoples. Camel bulls are normally slaughtered at birth, it being necessary to keep only about one for every twenty cows in a herd.

Dogs are as numerous as local economic conditions permit. In Saharan oases they were once an important item of diet, being raised especially for this purpose. When the population became converted to Mohammedanism, however, dog-eating was prohibited, because the animal was considered unclean. With this taboo came the disappearance of most dogs, because people could not afford them as a luxury. Here, as in several parts of the Oriental World, a competition between man and animal for food has been decided in favor of man.

LANDFORMS

Deserts and arid steppes have no water surplus to feed the ocean system. The only through-streams rise in places that are amply supplied with precipitation, so that in spite of diminishing discharge while crossing arid regions they have adequate volume to reach the other side. There are few streams in this category. The Colorado of the southwestern United States, the Nile, the middle Niger, and the middle Hwang Ho are the largest examples. The typical arid-climate stream flows into an enclosed basin, where it ordinarily wastes away on slopes, or possibly ends in a saline lake. Arid climates are characterized by this *basin drainage*. Streams are arranged in localized centripetal patterns. Their upland courses are quite normal as far as pattern is concerned, tributaries joining trunk channels much as limbs are fastened to the trunks of trees. If the lower course flows down a broad slope, *distributaries* fan out from the main channel over a depositional cone of their own making. Each channel cuts a trench at time of flood, but tends to fill it as waters subside. Gravel, sand, and other parts of the stream's load are dropped, even to the degree of over-filling trenches, so that during subsequent floods the new line of flow takes another course. The cone-building distributaries shift from channel to channel as their work of filling enclosed basins, *bolsons*, progresses.

The initial landforms of all regions are caused by geologic forces. Igneous activity may result in building such features as lava plateaus or volcanic hills and mountains. Faulting may tilt large blocks that slope gently, or may lower certain segments of the earth's crust, such as *grabens*, down-dropped blocks with rather straight sides. The Red Sea or the elongate valleys of the lakes of eastern Africa are illustrative of grabens. Folding and widespread warping may arch ridges or lift plateaus above surrounding territory, or lower extensive areas into basins. These initial landforms undergo modification through weathering, degradation, erosion, and other processes of attack. In humid climates, basins fill with water to the point of overflowing into rivers that lead to the oceans. There is a general transfer of rock debris from highland to coastal margins. In arid regions the transfer is mainly from local highland to nearby basin.

Aside from a few coastal areas, such as in the Low Countries or near New Orleans, there is little dry land that stands below sea level in the humid parts of the world. The coastal examples are inconsequential since the depression amounts to a very few feet, rarely as many as ten. Exten-

sive or deeply depressed sub-sea-level lands are peculiarities of arid climates. A deep initial basin in a humid region becomes a lake. Lake Baikal is an outstanding example. Faulting has depressed its bottom some 10,000 feet below nearby uplands, so that it lies more than 4,100 feet lower than sea level. Inflowing drainage keeps the Baikal basin filled to the level of its outlet. The only extensive sub-sea-level tracts in the United States are Death Valley, with a maximum depth of -280 feet, and the Salton Sink, somewhat more than 100 miles south of it, which is nearly as deep, -246 feet. These depressions both lie in the desert of the Southwest. The only large below-sea-level parts of Africa are the Shott (Chott) region, west of the Gulf of Gabes, which approximates -100 feet, and some land near the Siwa Oasis of the Libyan Desert, -65. The Jordan Valley graben culminates in the Dead Sea, the shores of which are the lowest lands of the entire earth, 1,292 feet below sea level. The extensive Caspian Depression reaches to slightly more than -85 feet. The most spectacular depression in inner Asia is Turfan (Tulufan), a deep graben east of the Tien Shan that sinks to a depth possibly more than 400 feet below sea level. All of these spectacular depressions are located in deserts; otherwise they would be lake bottoms. Possibly, because only deserts have these below-sea-level lands, people have tended to exaggerate lowness of desert elevations. For example, every now and then someone suggests that the Sahara could be reclaimed by connecting the desert with the Atlantic. Actually there is little land below sea level, either in the Sahara or anywhere else. Most of the Caspian basin is above sea level. Almost all desert basin floors stand well above sea level.

Desert mountains are hostile to growth of vegetation and development of soil. They share with Polar World mountains and the highest barren peaks full exposure to processes of disintegration and destruction. Rock surfaces expand under the heat of the mid-day sun and contract with the cool of early morning. Occasional wetting forms new minerals in crevices that pry adjacent blocks apart. Freezing weather develops similar prying power of ice, wherever moisture is present. Lightning shatters areas of impact. Rock falls strike surfaces lacking the cushioning effect of vegetation or soil. Cracks caused by earthquake vibrations remain open. Air bearing agents of weathering and reduction of solid rock to rock debris moves freely across unprotected surfaces. The attack is concentrated at the surface, where practically all fragmentation takes place.

The desert surface is also the scene of powerful agents of debris transportation. Winds whisk off

dust and shift sand-size particles. Rain acts as a degrading agent in many ways. Rain-beat, the impact effect of drops at times driven by high winds, dislodges small fragments. Cool rain chills and contracts expanded heated surfaces, cracking rocks badly if it arrives abruptly on hot days. Slope-wash carries debris to channels, where streams transport it on downslope as far as velocities are capable of rolling, sliding, or actually carrying fragments in suspension. Most rocks weigh from two to three times as much as equivalent volumes of water, but the buoyant effect of water (i.e. weight of the water displaced) reduces weights to from one third to one half their values in air. In mudflows there is very little difference between the weight of the moving rock debris and that of the transporting agent. Torrents and mudflows carry both huge volumes of material and individual fragments of large size. Desert mountains are stripped of debris about as rapidly as it accumulates on their surfaces. They therefore present not only barren, hard-rock exposures, but they tend to retain steep slopes. Jagged peaks, steep escarpments, and abrupt rims of resistant rock characterize desert landscapes. Polar landscapes and highest alpine regions are quite similar because they too experience similar types of attack and debris removal.

The lower boundaries of desert mountains and uplands are ordinarily sharply defined. One can practically walk along the line between the solid rock of the elevated feature and the uppermost margin of the sand or gravel deposits in an adjacent basin. The basin deposits slope rather steeply near mountain margins, gradually assuming gentler gradients with greater distance, often ending in central flats. The upward concavity of the depositional slope is so gentle that while traveling across it one often fails to notice its presence. On a long, straight road there is always the feeling that a hill lies ahead, whether one is ascending or descending the slope, but the immediate surroundings seem flat, or nearly so. The effect of the "hill" ahead moves forward as one approaches it, like the "jake" caused by looming.

Mountains cover rather small fractions of most desert surfaces. The greater part of a desert ordinarily consists of basin deposits. These are commonly differentiated into various surfaces, each of which has a distinct name in the vocabularies of desert peoples.

Reg (Western Sahara), *serir* (Eastern Sahara), or *gobi* (Asia) is the most common type of desert surface. It covers at least half of the Sahara and probably more than three quarters of Arabia and

most other deserts. It is the almost-universal cover of the deserts in the southwestern United States. Reg, or gravel-surfaced desert, forms on desert-basin deposits because wind winnows out all dust and finer particles, leaving larger stones concentrated in a thin layer at the surface.

Across the reg run *wadies*, *arroyos*, or *washes*; typical desert stream channels. Flow is anything but gentle or permanent. It ordinarily arrives as a flood, in many cases with little or no warning, except for the roar that accompanies the hurling of stones in churning waters. Wadi flow is typically torrential, sweeping along materials of all sorts including blocks of rock several feet in diameter in its upper, steeper course, and gravels of various smaller sizes downstream where the gradient is gentler. Flow disappears as suddenly as it rises, and the stream bed ordinarily remains dry for months, or even years. Each flow is normally accompanied by the displacement of a large amount of rock debris, downslope, toward the basin floor.

The wadi nourishes the reg. Individual depositional cones of debris formed by a number of adjacent wadies emerging from a desert upland more or less coalesce to become the long slope that leads from bedrock upland to basin flat. The wadies are the great agents of transfer of materials from mountain to basin; enemies of both in the sense that they tend to eat away the former and to smother the latter with their debris. The reg creeps higher along the sides of uplands as the work of the wadi progresses. The surface of the reg, however, is mainly quite different from that left by the wadi. Only near active channels, and especially after floods, does one find all the materials that the wadi deposits, unsorted debris, with sediments of many sizes scrambled together. Elsewhere is the comparatively compact, gravel-surfaced reg, which ordinarily lies for years, or even centuries, in relatively undisturbed condition. Its materials have been deposited by wadis but they evidence long years of wind action and baking under the sun.

The wind attacks the reg, but only superficially. Dust or silt particles are swept away about as soon as wadi deposits dry out. Sand grains disappear when the wind grows violent. The residue of coarser material settles during the winnowing process, gradually forming a protective cover for all materials below. Stones lying undisturbed on the reg surface assume a shiny, dark brown or blackish patina, *desert varnish*. Together they constitute a *desert pavement* that shines like a black-top highway when the sun stands at low angles

in the sky. Many of these pavements are excellent surfaces for automobile travel, and the reg is rapidly becoming the unrestricted highway of the desert. In some cases, however, where very fine material lies immediately below a thin desert pavement, the reg is tough-going because the weight of an automobile or truck pushes through the stony veneer into the underlying sand or dust.

Coarser types of reg are almost impassable to automobiles, camels, or men on foot. The *serir* in the Libyan Desert is largely so surfaced, with stones of considerable size heaped together over extensive areas. These are thought to be extremely ancient regs that have lost most of their original small-sized rock debris. Former gravels have disintegrated into sands that have been blown away, leaving only a residue of coarsest fragments behind.

Reg materials grow finer toward basin flats, because the effect of torrential flooding diminishes with increasing distance from bordering uplands. Where basin floors are flat, they may consist mainly of clay which is held together either by the presence of moisture or by salts that cement individual grains to their neighbors. Salt flats (*sabkha*, *playas*), are normally white and glisten under the sun. When thoroughly dry, they are the finest automobile highways of the desert and many roads lead to them. When damp, they are treacherous. An experienced driver never proceeds in a direction where he finds even the slightest increase in power requirements, or slightest sinking of wheels to form tracks. The danger of wet places, where cars promptly sink to depths where extraction is impossible, or where neither man nor pack animal can walk, is always in one's mind when crossing salt flats. One side of a flat may be high and firm, the other damp and impassable. When flooded, these flats become *playa lakes*, which may last for days or weeks, or remain dry for months or years.

The margins of playa floors are commonly fringed by rather rough surfaces. The local reg is likely to consist of fine materials that are readily gullied at times of flooding and eroded into hummocks and irregular, clayey masses. Where trails are poorly developed it is often difficult to drive an automobile across the zone between firm salt flat and firm reg pavement.

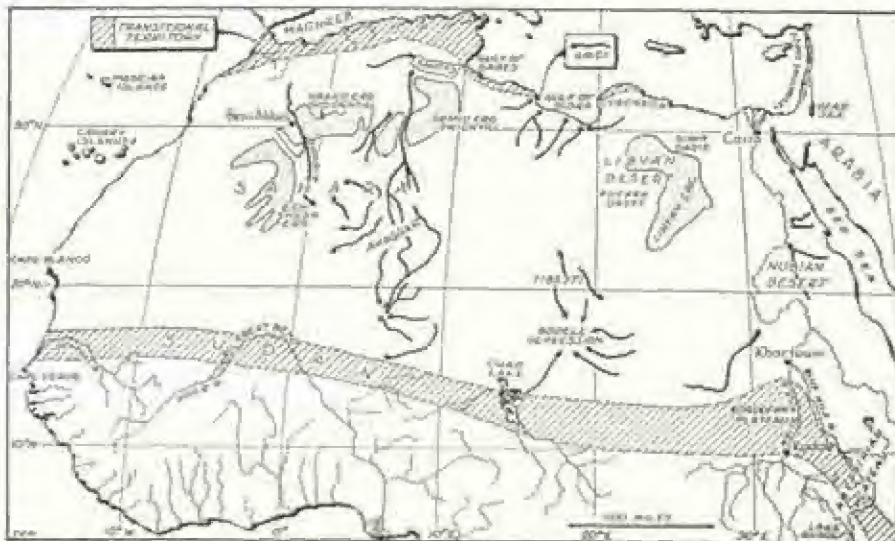
Desert basins trap soluble as well as other products of rock disintegration or decay. On mountains, throughout the upper reg, and wherever drainage is provided, either across the surface or by seepage beneath, waters dissolve various salts and carry them away. If enough drainage exists to maintain a lake in a basin, the water is ordinarily saline (common salt) or alkaline (various

carbonates, such as of sodium and potassium). Great Salt Lake in Utah and various other large lakes in Nevada are excellent examples, as are the saturated Dead Sea, the faintly saline Caspian and its peculiar, saturated Gulf of Kara Bugaz, Lake Aral, several lakes in Persia, and others in the Dry World territory farther east. All *terminal lakes*, at the ends of drainage systems, whether fed by surface or sub-surface waters, grow more and more saline or alkaline as time goes on. Many basins that contained enough water to maintain lakes during the Ice Age are now flooded by large salt flats. In some cases the salt is pure enough to be an important economic resource, whether it be common salt (sodium chloride), gypsum (calcium sulphate), trona (a form of sodium carbonate), some potash-containing combination, borax (borate of sodium), or other soluble material.

Any body of water that is not saline is either new or is other than terminal in a drainage system. There are small depressions, *hissi*, where water collects after rains, which may render certain desert trails useful during and immediately after showers, and more permanent pools along wadi courses, where water is either exposed to the surface, or available within digging distance. There are also flows among sub-surface channels not indicated at the surface, between the contacts of various kinds of rocks, or along fractures, which in some cases become *oases*, where water is available naturally, or artificially as the result of man's labors. Then there are larger, dependable lakes, *dayas* or *vleys*, which have obvious, or hidden outlets, so that they remain fresh. Lake Chad is the largest example, draining northeastward into the Bodele Depression.

Rather small amounts of desert water actually reach lakes or appear at the surface in usable volumes. The normal cycle that occurs after rainfall is seepage within a short distance into the ground, followed by upward movement and evaporation prior to arrival at the surface. Quite commonly there is some downslope movement during the seepage cycle. These ephemeral waters dissolve plant acids and rock salts, moving them downslope and concentrating them on or near the surface in the form of crusts. Lime (calcium carbonate) and other soluble salts are thus concentrated in the lower reg and difficult marginal territory, as well as in playa flats. Much of the water in low basins is either unusable by man, or else of secondary usefulness, as for example, it may serve for camels and be helpful in maintaining their milk supply. In the cold deserts in winter, poor drinking water is commonly placed in containers and allowed to freeze. Since the ice contains smaller amounts of the impurity than the water, it may be melted for drinking or used as a base for tea or soup.

Extensive sand fields (*ergs*), are generally confined to basins where there has been considerable winnowing of the reg. Large bodies of sand move extremely slowly along with the wind, downwind. Adverse slopes trap them, so that the sand may be piled high along the lee sides of basins. The important fact about sand-field distribution is that there must be a source for the sand. Vigorous wadies bring sufficient amounts in some cases. In other cases ergs are related to lake beaches, especially those of Ice-Age lakes that no longer exist. Sufficient sand for the formation of ergs



Sahara:
ergs and wadies

is comparatively rare. In spite of general reputation, or appearance on maps, it is doubtful whether any desert is more than one quarter covered by erg and probable that most deserts contain far less.

Ergs are the true sand-seas. Their rough surfaces resemble tempestuous waters, but the wave crests are rather permanently fixed in position, so much that they form reliable landmarks. The waves are complex in plan and shape and only superficially resemble the sand dunes of places where sand supply is scant. Erg margins advance during periods of time of geologic proportions but where they have been known for several centuries, as along the side of the oasis Taghit, on the Zaouri (Sauri) side of the Grand Erg Occidental of Algeria slightly north of Benni Abes, no movement has been detected. Ergs are avoided as much as possible by trails of all kinds. They afford no opportunities for grazing, and are practically lifeless. Crossing an erg by caravan is done as rapidly as possible, at night.

Firm sand is rippled by small waves that ordinarily present darker streaks on windward than on their steeper lee slopes. Ripples normally rise an inch, or a few inches, above the troughs between their crests. Routes across sand are taken on rippled surfaces wherever possible. Soft sand appears uniform in color and is unrippled. In many cases it is practically impassable. Men may scrape away some of the surface in order that camels find footing, but such exhausting labors require more energy and perspiration than men are likely to be able to afford. *Sifts*, fairly high ridges of soft sand, project downwind from elevated points in the erg and elsewhere, and form formidable barriers to travel in the desert.

Where the supply is rather limited, sand travels as waves or elongate trains, downwind. In some cases *dunes*, or processions of dunes are formed. The most spectacular of these is the *barkhan*, with a steep face of soft sand between its forward-projecting horns and a gentle slope of harder sand facing the wind. Barkhans are practically unknown in the Sahara, but occur in Turkish

and Mongolian deserts, in the southwestern United States, and elsewhere. The frontal crescent is commonly over a thousand feet wide and the crest may lie fifty feet, and in some cases much more, above the surface over which the dune moves. Moving sand is a menace to man in various ways. It obliterates tracks that tell of lurking enemies or the presence of game. It encroaches on oases, obscures landmarks, covers water holes, and is an enemy of grazing land. Hard-driven by wind it wears away poles, sides of houses, frosts glass, and has been known to remove completely the enamel of one side of an automobile within an hour. These effects extend upward only for a few feet; commonly there is no destruction above a height of six feet, even after many decades of exposure.

Sand collects against hills, forming *oghurds*, with cores of rock which may be completely covered, or nearly so. Many reports concerning dunes of extraordinary height actually relate to hills only veneered with sand.

True rocky desert occurs mainly in mountains, but some plateaus of considerable extent and lower territory form rocky desert, or *hammada*. These bare surfaces shine with desert varnish, as do the pebbles of the reg. Where sand sweeps across them, they exhibit the polish of sand blast. As a rule they are extremely difficult to cross, if rough and elevated, but *hammada* formed out of flat-lying rocks, barren simply because no wadi has been able to send its waters far enough to reach it, are hard, fairly usable roadways for motor vehicles.

The prevailing color of the desert is gray. Where vegetation exists it is most commonly that color. Animals with darker hues in humid regions have light gray relatives in the dry climates. The color of most rock debris is gray. The patina of desert varnish is darker and salt flats are whitish.

Mountains of barren rock may exhibit deep hues of red, purple, or other colors but across the most extensive type of desert surface, the reg, it is rare that the eye encounters patches of color that enliven the drab monotony of gray landscapes except during the infrequent periods when the *ashab* appears.

28: Dry World Peoples

Desert means deserted, uninhabitable because of insufficient water supply. Only by extension has it come to mean a kind of landscape, a type of climate, or an assemblage of plants that survive under conditions of extreme aridity. Few people live in the true desert today, except in oases, where they are likely to be as crowded as in cities. In Egypt, a huge oasis where population is both urban and rural, the density exceeds 1,000 per square mile in some rural districts.

RACIAL GROUPS

Negroids, Caucasoids, and Mongoloids are all present in the Dry World, the latter two being most numerous today.

Negroids are now distributed widely throughout Africa to the south of the Dry World. There is also a considerable Negroid substratum in the population of the Sahara, Arabia, Persia, India, Assam, Burma, and Malaysia. Negroid peoples in both pure and mixed forms are numerous in the western part of the Pacific World. There is considerable evidence to indicate that some proto-Negroid stock originally covered southern Asia and that migrants went both west to Africa and east into Pacific Islands, where some have survived in rather unmodified condition. In the central homeland, they were invaded by other peoples, so that the Negroid stock was admixed or absorbed. To the east of India, the invaders were both Caucasoids and Mongoloids, predominantly the latter in more recent times. To the west they were mainly Caucasoids, with Mongoloids appearing more recently, but not in sufficient numbers to become dominant anywhere.

The appearance of non-Negroid peoples in the central parts of the old proto-Negroid realm was probably an event of the late Ice Age. Though central Asia was not covered by such large and extensive ice caps as North America or northwestern Europe, ice did extend far down the sides of its mountains and cold must have been intolerable during glacial stages. Eurasians were driven southward.

Glacial stages were accompanied by *pluvial periods* in marginal lands to the south. Many wadies

of the western Sahara were active *perennial* streams during glacial stages. Since the last main ice retreat the climate has become notably drier, and most Saharan wadies are now in decay. Much of Arabia seems to have been a well-watered land during glacial stages. The effect of the pluvial periods must not be exaggerated. The Libyan Desert is quite free from topography that suggests even a moderate increase in rainfall. At best, the rainiest times during the Ice Age brought steppe climates to some territory that is now desert, and humid climates only to some lands that are now steppe. A desert core remained in Libya and southern Sahara.

The early appearance of man in this territory was probably prompted by inhospitable cold to the north and stimulated by more attractive conditions than now exist in some of the arid territory. It was wholly prehistoric, but archaeological evidence suggests a late Ice Age date. Ancient artifacts indicating Negroid origin are relatively abundant, and early Negroid peoples are evidenced in the racial characteristics of today's population, everywhere in the belt between the more purely Negroid parts of Africa and southeastern Asia.

Caucasoid stock is now dominant everywhere in the Dry World west of India and south of the trans-Caspian Depression. Practically all races of Caucasoids are represented, Mediterranean stock being the most common and most diversified.

Basic Mediterraneans, short, slender, delicately built peoples, with long to medium-long heads, straight, narrow noses, olive or light-brown skin, are dominant among the Egyptians, Berbers and Arabs of Arabia, and Jews of Palestine.

Atlanto-Mediterraneans, more robust than Basic Mediterraneans, taller, with long heads, straight to convex (hooked) noses, and whiter skin, dominate most of North Africa to the west of Egypt, and are conspicuous among the peoples of Arabia, Palestine, and Persia (Iran). In east Africa they are admixed in various ways with Negroes, and extend well south of the limits of the Dry World.

Irano-Afghan Mediterraneans, tall, long-faced, high-headed, hooked-nosed people, predominantly dark skinned, with a minor tendency toward blondism, are the predominant stock of Iran,

Afghanistan, and parts of India. They are also numerous in the trans-Caspian Depression, and are fairly abundant in Arabia and north Africa.

Alpines, with broader heads, stocky, and similar to European Alpines, are numerous in Asia Minor and northeastward into Siberia.

Dinarics, taller and more round-headed than Alpines, are numerous in Asia Minor and Syria.

Armenoids, with extremely round heads that are decidedly flat in back, as well as high, giving them a peaked and pointed appearance accentuated by sloping foreheads, prominent convex noses of great length, with fleshy tips, moderately full lips, and abundant dark brown to black and somewhat wavy hair, thick beards and eyebrows that commonly meet above the nose, and rather short (5 feet, 6 inches, average) bodies that tend to become corpulent in middle age, are abundant in Asia Minor and dominant in Armenia and northeastern Turkey. Some of the Arabs in southeastern Arabia belong to this particular stock.

Mongoloids dominate the eastern part of the Dry World. This division of mankind may turn out to be far more complex than other racial groups, but to date it has not been the subject of adequate study. As a whole, the group is readily recognized by such features as narrow eyes, low noses, prominent cheek bones, and prominent incisor teeth, which are likely to be concave in the rear.

Some anthropologists believe that the Mongoloid racial group is the last type of man to become differentiated and specialized. There are certain Mongoloids who are quite Caucasoid in appearance and are classed as Paleoasiatics. Most American Indians belong to this subdivision, as do certain Dry World peoples, especially in Tibet and remote parts of Mongolia. Most Dry World Mongoloids, however, belong to the dominant Neosasiatic stock, which includes such peoples as

Chinese, Japanese, Tungus, and most of the population of Mongolia.

From the standpoint of prehistory it is reasonable to suppose that the Dry World east of the great central-Asiatic mountain knot, the Pamirs, was originally inhabited by Mongoloid peoples. Paleoasiatics were gradually invaded and admixed with Neosasiatics. To the west were other round-headed peoples, proto-Caucasoids, who migrated southward from the trans-Caspian Depression and across the Anatolian and Arabian plateaus. Here they encountered Mediterraneans, with longer heads. Other Mediterraneans were living in southern Europe. Negroid peoples, once widespread from western Africa to the Pacific, were displaced both by round-headed and long-headed Caucasoid stocks everywhere in the Dry World west of India. It is a long and complicated history that has left a racial medley in its evolution. Practically all ancient peoples of the western Dry World were long-headed and those of the east, round-headed. The invasion of round-heads into the central part of the Dry World probably occurred at the end of the Ice Age, and certainly was prehistoric. The Hittites of Asia Minor and the Sumerians of Mesopotamia, the earliest western Asiatics known to history in even a fragmentary way, were round-headed. The small-headed, round-headed peoples of southeastern Arabia probably remain as evidence of these early appearances of round-heads in the Dry World.

Though the Sahara was once the home of Negroid peoples, most pure types have disappeared today. The typical "Bantu-speaking" Negro remains as a remnant population only along the borders of the Sudan. In the remote highlands of the central Sahara are some 10,000 Tibbu, who seem to be remnant of the original Saharan people. Though in some racial respects they are purely Negroid, they lack fuzzy hair, thick lips, and flat noses of the African World Forest Negro. Neighbors consider the Tibbu more-than-human from



Irano-Afghan Mediterranean
(from E. A. Hooton, *Up from the Ape*. Copyright 1946 by The Macmillan Company)

the standpoint of physical endurance. They held the Kufara (Cutra) Oases of the mid-Libyan Desert until the end of the eighteenth century and were probably there during the time of Herodotus, who mentions an extremely agile group of inhabitants in that remote place. To the south of the Tibbus, in territory extending to Lake Chad, are some 10,000 or fewer closely related but more-Negroid Borku.

Negroid peoples to the east of the Tibbu and Borku are mixed racial stocks. The Nilotics (Nilotes) of Anglo-Egyptian Sudan and upper branches of the Nile are long-headed peoples with less protrusive faces and higher foreheads than true Negroes. Their noses vary from broad to narrow and their skin is extraordinarily dark. Bodies are slim and tall, the average height being at least 5 feet, 10 inches. The Shilluk, along the west bank of the Nile in the eastern Sudan and the Somali, southeast of Ethiopia, are notable for narrow noses, that seem to indicate considerable Mediterranean admixture. To the south, mainly in the African World are the Half-Hamites, with light chocolate to reddish skins, woolly hair, and noses varying from thin to flat.

Aside from such shiftings of Dry World peoples as the spread of Arabs northward and westward after the death of Mohammed, or the arrival of Turks in territory south of the trans-Caspian Depression, there have been several notable invasions of outsiders during historic times. Nordic Vandals and Goths crossed into Africa, along the coast east of Gibraltar as far as Tunis. Chinese have penetrated dry lands in considerable numbers as far west as Sinkiang, in Tarim Basin. Russians of various racial stocks are making conspicuous inroads today along lands beyond the entire Soviet frontier. The western part of the Dry World has a very considerable Negroid population resulting from slavery. The natives, *haratin*, of Saharan oases are very largely Negroids of recent introduction.

Table 19 Summary of the major groups and races characteristic of the Dry World

<i>Negroid group</i> (mainly in the Sahara)	
"Bantu-speakers"	(mainly along the Sudan border)
Nilotic (Nilotes)	(mainly in eastern Sudan)
Half-Hamites	(extreme eastern Africa and southward)
Tibbu	(central Saharan uplands)
Borku	(south of Tibbu, to Lake Chad)
<i>Caucasoid group</i>	
Mediterranean	(Atlantic to Afghanistan)
Basic Mediterranean	(Egypt, Levant, and Arabia)
Atlanto-Mediterranean	(Atlantic to Persia)
Irano-Afghan Mediterranean	(Persia to India)

<i>Nordic</i> (Northwestern Africa)	
Alpine	(Asia Minor, northeastward to Siberia)
Dinaric	(Asia Minor and Syria)
Armenoid	(northeastern Asia Minor)
Mongoloid group	(trans-Caspian Depression, eastward)
Paleoasiatics	(Tibet and remote places)
Neoasiatics	(trans-Caspian Depression, eastward)

LINGUISTIC GROUPS

Most of the languages of the Dry World are not Indo-European. Ural-Altaic tongues predominate in all territory north and east of Mesopotamia, and Semitic tongues prevail to the south and west. Though a complete list of Dry World languages would be many times longer than a list of European World tongues, most of them are spoken by limited numbers of people and few have been reduced to written form. In the west Arabic is the one great language with a literature. The linguistic situation is more complicated to the east, but the main languages are Ural-Altaic.

Western European languages, such as English, French, Italian, and Spanish are spoken in cities and some rural territory along the northern coast of Africa and in the Levant, and, of course, are encountered among educated people everywhere. Greek is spoken around all fringes of Anatolia. In the plateaus east of Anatolia, are Armenian, Persian, and Afghan, as well as several minor Indo-European languages. Great Russian has made important invasions around the Caspian Basin and is rapidly becoming known in lands to the east.

Ural-Altaic languages are almost universal among peoples in the Dry World north of the Iranian Plateau. Finno-Ugrian tongues and Tungusic appear in the far northeast. Mongolian tongues predominate in the basins east of the Pamirs, and at various places as far west as the desert part of Europe, where Kalmuckian is the native language. Turkish-Tataric speech is extremely widespread, from Tarim to Anatolia, with Osmanli reaching into Europe as the tongue of the Ottoman Turk.

Indo-Chinese is present as Tibetan, in the high plateaus south of the central Asiatic basins.

Chinese dialects have widely invaded Mongolia and Tarim.

Caucasic languages in almost innumerable variety appear in and around the borders of the Caucasus Mountains.

Semitic dialects and languages dominate the entire region from Mesopotamia south to the Indian Ocean and west to the Atlantic. Of these

Arabic is the great literary language, but such tongues as Mesopotamian, Syrian, Egyptian, and Ethiopic are recognized as being distinct. Semitic-speaking territory runs south in Africa to Zanzibar, southeast in Arabia to Oman, and west in the Mediterranean to Malta. Many Semitic dialects have been given individual names, such as Bantahari and Harsusi, which are variants of Mahri, a tongue that is spoken in southeastern Arabia.

Table 26 Summary of the main native linguistic groups in the Dry World

- Indo-European* (fairly minor language stem)
 - Centum languages* (hardly represented)
 - Hellenic* (fringes of Anatolia)
 - Greek*
 - Satem languages* (mainly between Anatolia, Mesopotamia, the Caspian, and India)
 - Iranic* (descended from Aryan)
 - Afghan, Baluch, Modern Persian, Kurdish, Ossetic, Talyshian, Yezidi*
 - Anatolic* (mainly west of Iranic territory)
 - Armenian*
 - Slavic* (a rather recent intruder)
 - Great Russian*
 - Ural-Altaic* (most important stem north of the Indo-European belt)
 - Finnic-Ugric* (in the extreme north and northeast)
 - Tungusic* (mainly from Tarim eastward)
 - Mongolian* (mainly from Tarim eastward, outliers to west)
 - Mongolian, Kalmuckian, etc.*
 - Turkish-Tataric* (important group from Tarim westward)
 - Turkomanic, Ottoman (Turkish), Kirghizic, Tataric, Bashkirian, Nogai, Karachai, Karapapakian, Kizilbashian, Kumykian, Taltajic, etc.*
 - Indo-Chinese* (extends north from Burma, etc.)
 - Tibetan*
 - Chinese* (southern borders of Mongolia, Tarim)
 - Caucasic* (complex group in and around Caucasus)
 - Semitic* (dominant tongues of Mesopotamia and south, west)
 - Arabic* (main literary tongue of western Dry World)
 - Syrian, Mesopotamian, Egyptian, Tunisian, Maltese, Oman, Zanzibar, Ethiopic, Shuhari, Mahri, etc.*
 - Hamitic* (once dominant language stem of northern Africa)
 - Coptic* (survival of Ancient Egyptian)
 - Berber* (survival of Ancient Numidian and Mauritanian)
 - Ethiopian (Cushite), Afar, Agao, Beja, Galla, Somali, etc.*
 - Negro language stems* (Sudan and central Sahara, oases, etc.)
 - Sudanic* (with tremendous variety of languages)

Hamitic languages were once almost universal and exclusive in northern Africa. Ancient Egyptian has survived as Coptic, which is used as a ritualistic language much in the way that Latin is today in the Roman Catholic Church and in academic circles. Ancient Numidian and Mauritanian, to its west, survive as Berber, the only widespread Hamitic language in northern Africa today. Ethiopian (Cushite) of the common people of Abyssinia (as distinct from the Semitic tongue of the upper class), Galla, Somali, and other languages spoken around the Horn of Africa and along the Indian Ocean coast are Hamitic. The only people who write Berber are the Tuaregs of the western Sahara. This is the only survival of the ancient Libyan alphabet, *tifinag*.

Negro languages of tremendous variety, which are lumped together for purposes of convenience and hiding of ignorance under the general term Sudanic, are spoken by peoples along the entire southern fringe of the Dry World, by the Tibbu and Borku, and in various mixtures in Saharan oases.

ECONOMY

The typical Dry World inhabitant is a pastoral nomad. Agriculture cannot be carried on, except in a few favored areas. Few plants can be harvested by man. The small leaves of widely scattered, low shrubs of the desert or isolated tufts of short bunchgrass of the dry steppe can be utilized only by animals, which in turn provide a livelihood for man. The pastoral nomad has his herd of camels, oxen, asses, horses, sheep, or goats, but little else. His life follows routines dictated by the needs of his animals. His clothing, shelter, and food are mainly the direct product of his flocks. Trade is ordinarily a matter of barter. The price of a good wife is measured in terms of animals, twenty oxen or four camels being a high price for the daughter of a successful herder.

The desert nomad has little meaning from the standpoint of international trade. He provides only a meager surplus for commerce beyond his own frontiers. The better steppe areas of European World peoples produce most of the meat, leather, and livestock required by highly industrialized nations. The needs of the desert nomad are few and his demands on foreign nations are light. The Industrial Revolution has affected him but slightly, yet some of its products have become necessities. Guns and ammunition, cotton cloth, knives, and various wares of metal have come more and more from the outside world, and the remote herder is becoming increasingly dependent on them. The tin can, a scrap of iron

suitable for use as a peg, or other small item cast off by the foreigners may prove extremely useful. The possessions of a nomad family far from the channels of trade may consist of little more than a small tent, made either of skins, camel hair, or other fibers spun and woven with a few crude, home-manufactured implements. Other items may include a few antelope horns for tent pegs, a little rope of twisted hair, two or three iron pegs, several vessels made of woven reeds, a few skins for containing water or other liquids or foods, a large stone for use as a hammer, some crude, home-woven blankets or skins, a flint and steel for starting fire, a few items of clothing, and a gun, with a few rounds of ammunition for protection or hunting.

The possibilities of establishing trade with most Dry World peoples are sharply limited. The annual income ordinarily amounts to only a few animals per family and, in all, there are not many families. The deserts are quite deserted, and the dry steppes are sparsely populated. In certain favored areas, especially on uplands, a small income may arise from gathering medicinal herbs or roots. Among the adaptations of plants to extreme aridity is a high oil or resin content in leaves or sap. Gum arabic, myrrh, labdanum,

frankincense, and other oils and resins, here and there provide livings or supplement the returns of pastoral nomadism.

Pillage and robbery rise practically to the level of professions in remote areas. If death be the penalty for failure, it is accepted with complete indifference. The Mohammedan is a stoic and believer in predestination. He arises from his prone devotions to attack and murder if God provides the opportunity, praises the Almighty if successful, or accepts the result of failure as being ordained from on high. A keen intellect is necessary for success. The tracks of individual friends, enemies, camels, or other animals may be read as successfully by a desert dweller as fingerprints by an expert criminologist, and even their time of origin may be estimated with utmost skill. The choice of best routes and determination of most likely points of ambush or attack requires an exact kind of knowledge of the terrain. The most successful raiders become mythical heroes, on a par with Robin Hood, Jesse James, or Billy-the-Kid. Bu Zaid is a regular Paul Bunyan of southeastern Arabia. Conscience or religious scruples rarely stand in the way of the pillager; on the contrary they often



Caravan at water hole, Saudi Arabia (U.S. Army photograph)

spur him on because his victims are commonly people of a slightly different sect, or members of tribes with whom feuds have long been in progress.

The caravan owners are the true nobility of the Dry World. They not only are transporters but also merchants and traders, conveyors of news, and not uncommonly the owners of oases, flocks, or natural resources such as salt deposits or acacia groves. They must match wits with the pillagers, provide protection for goods and charges, bargain successfully with producer and consumer, and plan journeys with utmost skill and precision. "Camel men" are also the native fighting forces.

Most camels can travel a week without water, but they have to eat almost daily. In cool weather the interval between waterings may be extended to two weeks, or even twenty days if animals are in excellent health. In the heat of summer camels must drink every four or five days even though marches and grazing take place at night. Unless fodder is provided at least every other day, camels weaken rapidly. Caravan routes and journey plans depend primarily on the availability of pasturage and somewhat secondarily on the location of water holes. Though the ridiculous camel shuffles along in an awkward, slow, loose-jointed way, a caravan normally moves about three miles per hour while on the trail, or twice the speed of fastest oxen transportation. The leader of the caravan must plan not only the accomplishment of the major objective of his journey, but also its minute details with provision for alternatives wherever necessary if, for example, encounters with pillagers occur, if a water hole is found defiled, or if other caravans have overgrazed certain areas along the way.

The agriculturalist occupies a lowly place in Dry World society. The lands he cultivates are normally the property of others, and his share is likely to be one fifth of what he produces. The caravan owner pays him the lowest possible price for his surplus and exacts highest prices for the wares he brings. The oasis is ordinarily rife with filth and disease, especially malaria. The marginal steppes are supplied with such uncertain precipitation that frequent crop failures preclude the possibility of more than occasional intervals of prosperity.

An oasis is a place where a dependable supply of water exists. The idea of a resident population, even if consisting of a very small number of persons, is generally implied by the term, as is the presence of at least some area of green vegetation. The intermittent water hole along a wadi

course, which may be dry for several months of the year, is less than an oasis, as is the small trickle of a tiny desert spring. The grandest oases are entire river valleys, such as the Nile Valley in Egypt, Mesopotamia, or inhabited tracts along the Syr Darya and Amu Darya which lead to Lake Aral (Aral Sea). Many oases are depressions in layers of rock that contain considerable ground water. The water may reach the surface under artesian head or may require the sinking of wells, or other subterranean means of making it available. In some cases, water appears at or near the surface along faults. Such water is generally thermal, the supply being from hot springs, and not uncommonly contains dissolved salts that may render it poisonous to man or animals.

CONTRIBUTIONS TO CIVILIZATION

The origin of Europe's Neolithic (New Stone Age) culture was in the Dry World. The use of copper began prior to 5500 B.C. in the Dry World, but did not reach Europe for well over 2,000 years. Dry World peoples began using bronze prior to 3000 B.C., but Europeans were slow to accept technological achievements. The Bronze Age was well established by 2500 B.C., but it did not reach central Europe until after 2000 B.C., or northwestern Europe until after 1500 B.C. The Dry World Iron Age started well prior to 1000 B.C., but did not reach northwestern Europe until after 500 B.C.

The origins of western civilization spring mainly from the great potamic centers of Nineveh, Babylon, Assyria, and Egypt. Governmental organization was so fully developed that royal dynasties arose in Egypt by 3200 B.C. and the erection of pyramids was begun in 3000 B.C. These structures are imposing enough in themselves, but possibly more significant is the social organization that they imply. Cheops, the largest, which originally attained a height of 481 feet, was constructed out of 2.5 million large blocks of stone which was quarried in the desert some sixty miles from the banks of the Nile. Astronomical observations were being taken in Babylon at least as early as 2234 B.C. Most of our basic mathematics comes from Dry World peoples. We follow a Babylonian custom in dividing a circle into 360 degrees. The names we use for the combinations of stars in the sky originated among ancient Levantine peoples. The Ancient Greeks conceived the idea of the earth's sphericity, and measured the length of the equator by taking observations in Egypt, but the Arabs later devised a better way of computing its size and did so.

During Europe's Dark Ages the Arabs and

other Dry World peoples were caretakers of much of the civilization of the Ancients. They escaped the ravages of the Germanic tribes and the smothering effect of European theological disputes on learning. While practically all of Europe reverted to the throes of barbarism, Arabs were seeking new outposts in the Indies and along the coast of China, creating a trade in luxury items that was to have an important effect on Europeans, bringing from the Far East many of the fruits that now are staples of the Mediterranean, and developing a necessity for the Voyages of Discovery. They were also advancing as the greatest explorers and scientists of the western world.

To Dry World peoples we owe the domestication of most animals that have proved to be amenable to the will of man: horse, camel, sheep, goat, pig, yak, ox, and possibly the dog. To them we owe also most of our cereal plants (other than maize and rice), the date palm, and various other domesticated plants. Only the American Indian vies with the Dry World inhabitant in the matter of adapting and improving wild plants to the uses of man.

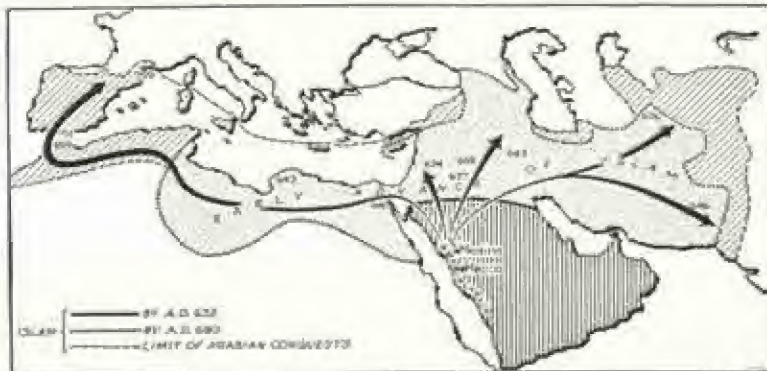
RELIGIONS

Dry World peoples have tended to put their gods in the sky, toward which they look for rain and from whence comes their heat. Worship of the sun, or of sun dieties, has been almost universal in their primitive forms of religion. Stars are regarded as influential in destiny. Our ideas of "lucky stars" and the like trace back directly to the Dry World. Meteors attracted widespread attention. Deep water holes, including wells that obviously have resulted from the labors of forgotten men, are commonly attributed to falling stars. The Ka'ba, at Mecca, sacred to the Moslems, is a meteorite known to far antedate the birth of the Prophet, and is the type of object most likely to be associated with supernatural powers among peoples who are used to searching the sky for "signs."

The pattern of many modern religions appeared in Zoroastrianism of the Persians.

Zoroaster (Zarathustra), possibly close to 1000 B.C., associated theology and morality, a combination not regarded as inseparable by many religions. Ormazd, in Dry World fashion a god of light and goodness, is pitted against a foe, Ahriman, who heads the hosts of evil. Man is created by Ormazd to assist him so that goodness shall prevail. Here is the contest with the Devil seen in Jehovah worship, Judaism, Christianity, and Mohammedanism, to mention subsequent Dry World religions in order of their appearance.

The Dry World today is mainly non-Christian. Its western part is solidly Mohammedan, and its eastern part is divided between Mohammedanism and Buddhism, Christianity in an old form survives in Ethiopia, where kings have been Christians since the fourth century. The Coptic Church of Egypt, which has kept alive an ancient Hamitic language, survives chiefly among peasants. The Roman Catholic Church has been making important gains in Morocco, Algeria, Tunisia, and Tripolitania, accompanying Europeanization of those lands. The Greek Catholic Church has influence at various places around the borders of Anatolia, and in some Dry World parts of the Soviet Union. The Armenian Church, which acknowledges the authority of the Pope of Rome but follows the ritual and general practices of the Greek Church, has a large following in eastern Asia Minor. Nestorian Christianity, which departed from the Orthodox Church in the fifth century, was once extremely active in sending missionaries eastward to Syria, Armenia, Arabia, Persia, Samarkand, and even to China. The Malabar Coast of India was reached by the sixth century and had a population of about 400,000 Syrian Christians when reached by da Gama. Northern China, reached by 636, witnessed several waves of persecution before some emperors eventually were converted. In 1265 the Nestorian Church had over twenty-five Asiatic provinces.



Spread of Islam

The rise of Mohammedanism after the death of its Prophet in A.D. 632 was almost meteoric. Amrou captured Alexandria in 640. The sword of Islam marched rapidly north into Mesopotamia and west across northern Africa, reaching Spain by 711. Prior to the year 1000 the religion had firm foothold in lands as distant as China, the East Indies, and the eastern coast of Africa. The Moslem World today covers northern Africa almost solidly, extending as far south as the delta of the Niger on the coast of the Gulf of Guinea and down the east coast of Africa to Mozambique (Moçambique), across the Indian Ocean to Malaysia, Borneo, the Spice Islands (Halmahera), and the Philippines, and quite solidly across Arabia, Anatolia, and the Iranian Plateau to western India, with important outliers in Bengal and southwestern China. It fringes most sides of the Caspian, extends northeastward into parts of Siberia and across Tarim to parts of northwestern China. In the world today there are some 316 million Moslems, 251 million of whom are in Asia and 60 million in Africa as a compact, mainly Dry World bloc. This may be compared with 742 million Christians of whom 421 million are Roman Catholics, 128 million Orthodox Catholics, or with a total of 11 million Jews, and a world population of 2.3 billion.

Buddhists extend north from Malaysia to southern Siberia and eastward to the Pacific. In the Dry World they occupy Tibet, part of Tarim Basin, and most of Mongolia, which they share with Taoists and other Far Eastern religions.

CULTURE REALMS

Though occupying more space in the Afro-European landmass than European, Oriental, or Afri-

can culture worlds, the Dry World is relatively homogeneous and need be divided into only two culture realms.

The Arab-Berber Realm is mainly Caucasoid, Semitic-speaking, and Mohammedan. Arabic is its main language. It is a closely knit realm covering the warm-winter part of the Dry World. Rainfall in all but its southern part is concentrated in the winter season. The date palm is the mainstay of oases. Foreign culture ties and contacts are principally with the European and African worlds.

To the north of the isotherm of January 32° F. lies the Turko-Mongolian Realm, where ice checks the flow of water for at least some appreciable season and where people must provide against the cold of winter. Though languages are mainly Ural-Altaic, they exist in great number, and many important intrusions of other tongues exist. The solidarity of Mohammedanism gives way eastward to Buddhism and other religions. Agriculture is more difficult. The useful date palm is replaced by the shade-giving but, from the standpoint of food, useless poplar or willow. Such rain as comes falls mainly during the summer. Winters are clear and bleak. Outside contacts are with the Eastern Culture Realm of the European World, or with the Oriental World.

The boundary between culture realms is reasonably sharp, there being little transitional territory that can be considered as a "shatter belt." Linguistically it is the northern limit of Semitic-speaking territory. Politically it extends along the southern boundary of Turkey, from the northeastern corner of the Levantine Sea eastward, and approximates the southwestern boundary of Iran (Persia) to the head of the Persian Gulf. Syria and the lowlands of Mesopotamia lie within the Arab-Berber Realm. The Persian Gulf and Gulf of Oman continue the boundary eastward.

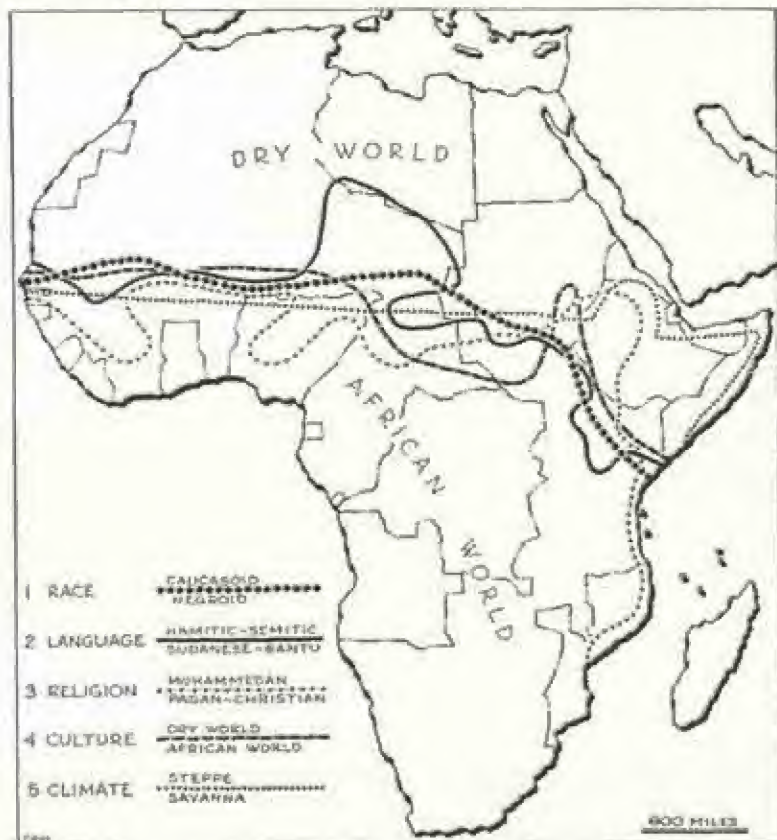
29: Mediterranean and Saharan Africa

The Arab-Berber Realm of the Dry World is remarkably homogeneous. It is dry, hot-summered, mild-wintered, Arabic in tongue, Moslem in religion, and Mediterranean racially. Its eastern part is historically old, the home of the ancient patriarchal empires of Egypt, Babylon and many lesser states, and not far removed from Assyria and Persia. Traditionally, here was the Orient, Asia, as opposed to the Occident, Europe.

The political scientist of ancient times would have been unable to predict the particular group of Oriental peoples who were to arise and spread their language and religion most widely. The Arabs were inconspicuous among peoples along the east coast of the Red Sea and seemed destined to play an extremely minor role in world affairs until the latter part of the seventh century A.D. when, with a suddenness almost unparalleled in history, they struck out in waves of conquest that carried across Berber North Africa, through Iberia, into southern France, southeastward to Oman and across the Indian Ocean to China, and northward into the Plateaus beyond Mesopotamia. Their religion was to carry much farther, across the heart of Asia to China, in the territory south of Iran (and January 32° F.), across the Levant, and westward to the Atlantic, not only did alien peoples adopt their religion, but also their tongue and much of their culture.

The transition between Dry

World and European World cultures is broadest in the western Mediterranean. Southern Iberia, long under Moslem-Moorish influence though rightfully classed as belonging to the European World, is within the transitional zone. The more humid parts of the Atlas Lands, south of the Mediterranean, are also transitional territory. Their major cities and coasts are largely Europeanized, but remote hinterlands lie well within the Dry World. Possibly all of Mediterranean Africa to the west of Cape Bon may become culturally French and part of the European World. The transition to Dry World culture will be abrupt in that event, because the steppe-climate belt south of the Mediterranean is rather narrow and useless territory from the European standpoint. The combination of dry season and summer creates drought so severe that



Dry World-African World
transition

only oasis agriculture is possible. There is little possibility of extending European agriculture far into marginal territory, as is commonly the case where summer rainfall occurs and where crops do well in at least some years.

The southern border of the Dry World across Africa lies along a broad belt of transition into the Sudan, where humid-savanna climate occurs, where rainfall is ample and grass grows tall. Culturally the Dry World has pushed the African World southward during recent centuries. Saharan landscapes change by gradual transition into those of summer-rainfall steppe. A wide belt of pastoral nomadism likewise grades into tropical agriculture. From the climatic standpoint the Dry World extends southward to a line of places where the annual precipitation is about twenty inches. This is not a very satisfactory definition of the southern boundary of the Dry World. It is faulty in excluding Ethiopia and its surroundings, which though amply watered are culturally parts of the Dry World.

A racial line between Caucasoid and Negroid is unsatisfactory in defining limits of the Dry World. About fifteen centuries ago this line ran along the base of the Atlas foothills and close to the Mediterranean. Inhabitants of the Sahara were Negroes. The racial boundary has now been pushed back to the mouth of the Senegal. The "Dry Bend" of the Niger, near Timbuktu (Tombouctou) is now fairly Caucasoid, but the upper and lower parts of that river are thoroughly Negroid. Much territory north of Lake Chad, extending far north in the central highlands of the Sahara, is Negroid but culturally part of the Dry World. No peoples are more capable of maintaining themselves in the Sahara than the Negroid Tibbu of Tibesti. There are also many Negroids to the east who are culturally Dry World peoples.

A religious boundary, between Moslem and pagan, keeps too far south to be a satisfactory one for the Dry World. Mohammedanism has made a great deal of headway in Negro Africa and is the religion attracting most converts today, even deep in the African World.

The real distinction between the Arab-Berber Dry World and the Sudan in the African World is cultural. To the north is a region of nomadism and oasis agriculture. Home is a tent, rather than a fixed dwelling. Society has a tribal basis, traditionally unrelated to property boundaries. Animals are used as carriers and for drawing loads. To the south is a land of hoe agriculture, with grazing here and there as an adjunct. Home is

fixed in position and ordinarily made of wood. Social organization is related to towns and property lines. No draft animals are used in typical hoe agriculture. Some lands are cleared by burning and seeds planted in wood ash. Most agriculture is primitive. The staple foods are starches such as yams, millet, and maize.

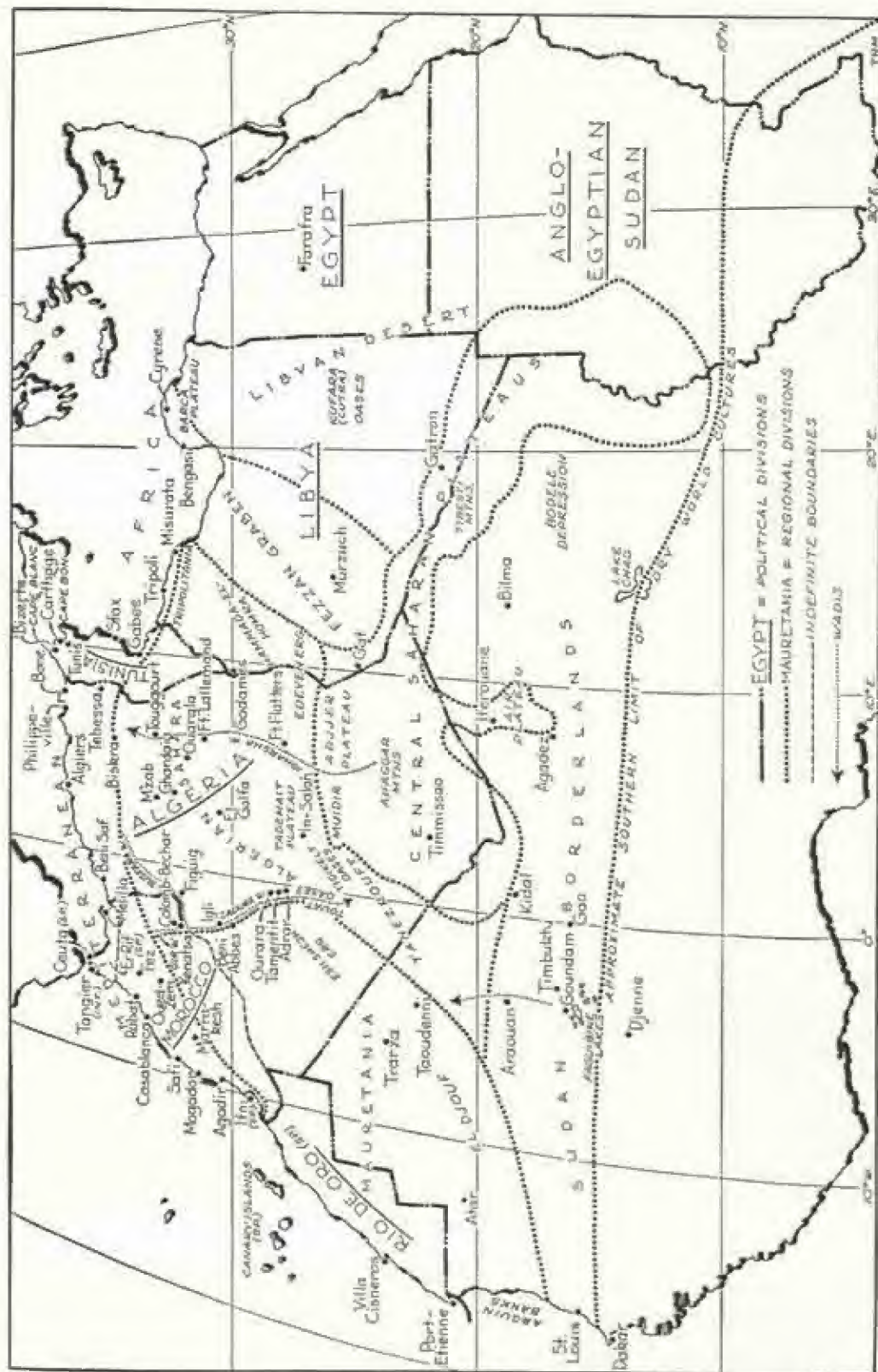
There is a transitional belt between typically Dry World and African World cultures, but a line extending from the mouth of the Senegal, eastward slightly north of 15° N. to the vicinity of Lake Chad, from thence to the southern side of Kordofan Plateau, and southeastward, past Lake Rudolf, to the mouth of the Juba River will serve as a reasonably good southern boundary of the Dry World.

MEDITERRANEAN AFRICA

Transitional Mediterranean Africa consists of Barbary (the Atlas Lands, or northern parts of Morocco, Algeria, and Tunisia), a small coastal strip of Tripolitania, and the Barca Plateau of Cyrenaica. Roughly this is a territory of about 500,000 square miles with a population of 21 million, somewhat over 10 per cent of whom are of European descent.

The Atlas Mountains, from Cape Bon to the tiny Spanish possession of Ifni, on the Atlantic, extend for about 1,500 miles and generally parallel the coast. Several ranges are individually named. The High Atlas, in Morocco, culminates in Tizi-n-Tamjurt with an elevation of 13,690 feet. A number of peaks rise above 10,000 feet, summits growing lower eastward, only a small part of Algeria having an elevation in excess of 5,000 feet. On the small Rif Range, across from Gibraltar, Beni-Hassan rises to 7,216 feet within twelve miles of the sea. Elsewhere there is generally a coastal strip, the *tell*, which is typical Mediterranean lowland. In Morocco there is a plateau, the *meseta*, back from the coast, with an elevation of from 1,600 to 3,200 feet. Arid valleys lie between the main Atlas ranges. Many contain saline lakes. To the south is the Sahara.

The Syrtic Depression, extending from the Gulf of Gabes (Little Syrtic) on the west to the Gulf of Sidra (Great Syrtic), is a coastal indentation flanked by the arid lowlands of Tripolitania. Here the Sahara and dry steppe locally reach the Mediterranean, the lowland widening and aridity increasing eastward. The Gulf of Sidra and low coastal plain is a depressed area between two major faults. The Misurata fault, which accounts for the western coast of the gulf, extends southward along the western side of Fezzan Depression to the eastern side of the Ahaggar Plateau.



Mediterranean and Saharan Africa: Index map

The Bengasi (Benghazi) fault runs from the western side of the Barca Plateau, along the eastern side of Fezzan to the western side of the Tibesti Highlands.

East of the Syrtic Depression is Cyrenaica, with the Barca Plateau rising to elevations somewhat in excess of 2,000 feet. Here the precipitation amounts to as much as sixteen inches, but most of the bedrock is limestone, water losses through seepage are high, and landscapes appear more arid than would be the case were the surface rocks some other material.

Mediterranean Africa has climates similar to those of southern Spain. Temperatures are moderate along the Atlantic coast. Those at Mogador vary from an average of 61° F. in January to 71° in July. The thermometer never goes above 80°, nor below 40°. The entire coast, as far east as Tangier, is an excellent health resort and could be one of the world's finest vacation lands if provided with proper facilities. Annual temperature ranges increase southward and eastward. At Marrakesh on the Moroccan Meseta monthly averages vary between 51° and 84°; at Algiers, on the Mediterranean coast, 54° and 78°; and at Biskra, to the south, on the edge of the Sahara, 52° to 90°. Annual precipitation varies from 15 to 20 inches along the coast to 40 or more on windward Atlas slopes and to 5 or less along the Saharan border. Interior valleys are dry. Summer drought lasts four months and more, except in a few highland areas. Only highest peaks experience regular winter snowfall.

Deciduous and coniferous forests clothe the higher ranges, flanked by cedars, cork oak, maquis, and typical Mediterranean plant assemblages at lower elevations. Here the olive thrives on poor soil and the vine in better locations. Mediterranean agriculture flourishes along the coastal tell, especially where an excellent black soil, *terra*, is developed. Grassy and saline steppes occur in interior valleys and toward the Sahara, where the transition to desert is abrupt.

The African lion once roamed the Atlas ranges. Atlas elephants supplied the circuses of Rome and were a source of ivory until Roman hunters exterminated them. These massive animals worked their way north during the Ice Age, when Saharan wadies provided migration routes across the steppe and arid heart of northern Africa. The elephant was the Carthaginian beast of burden and warfare. It had dwelt in Mediterranean Africa long enough to become a distinct species, smaller even than the docile Indian type and much inferior in size to the untractable African elephant.

CULTURE BACKGROUND

The early inhabitants of Mediterranean Africa were peoples very similar to those of Spain, typically Mediterranean in race. As Berbers they are still the basic population. The first historic intruders were Levantine Mediterraneans, Phoenicians. In the ninth century, B.C., Dido of Tyre founded Carthage, not far from the present site of Tunis. By 500 B.C. it may well have been the largest city in the world. Some estimate its population at a million. By the third century A.C., it was a large importer of cereals, because people of its hinterland found horticulture more profitable than field crops. This is in line with typical Mediterranean agricultural tradition. Carthage was destroyed in 146 B.C., at the time of the Roman conquest, rebuilt, and finally destroyed for good by the Arabs in the seventh century. Tunisia was an important Roman granary, supplying wheat, olive oil, and wine.

The 1,600 miles of shallow and low coast west of Egypt were feared by ancient navigators. On-shore winds were common, which made matters worse. Yet a marine snail, *Murex*, a source of purple dye, lived in those waters and could not be overlooked by Phoenicians. Cyrene, on the north slope of Barca Plateau, was founded in the seventh century B.C., because Levantine navigators familiar with the coast recognized the possibility of agricultural development of its limited hinterland. Romans conquered the coast of Cyrenaica in 106 B.C. and used it as a source for *Murex* and wheat. Ports along the Syrtic Depression were found useful as bases for a limited trade with Saharan peoples, who were able to furnish certain luxuries from central Africa. Both Greeks and Romans maintained these contacts.

A considerable Levantine element in the population, recognized today as Jewish, with the reputation of having been in Mediterranean Africa "since time immemorial," probably dates back to Carthaginian days. These "Jews" are entirely distinct from any European variety who have come to Barbary during recent centuries to seek refuge or carry on trade in coastal cities.

Arabs appeared during the latter part of the seventh century. A great Shereefian Empire was established, with a nobility claiming descent from Mohammed, through his daughter Fatima. The last main remnant of this empire is Morocco, the land of Moors, who are mainly Berber, but with Arab admixture. The Arabs, like the Levantines of antiquity, were of Mediterranean stock. The distinctions between Berber, Arab, Jew, and other Mediterraneans as they exist today are cultural, rather than racial. The main non-Mediterranean intruders of northwestern Africa were Nordic

Goths and Vandals, who preceded the Arabs by some three centuries. They did not remain as distinct as those in northwestern Spain, but blended so completely with the Berber that their presence today is indicated by scattered individuals, rather than by compact groups exhibiting common racial or cultural traits.

The eastern part of northern Africa came under Turkish rule. Tripolitania became independent in 1714, but was reconquered by Turkey in 1835. Turkish cultural influence has affected the people moderately but little Turkish blood remains in Barbary today.

Modern European expansion into Mediterranean Africa was prompted by attempts to stamp out piracy. The coastal Mauri and Berber tribes traditionally had ranked among the world's most capable sea-robbers. The trade of Gades (Cadiz) was long their particular prey. Rome established military forces in Tangier to keep them in check. The early sixth century Vandal kingdom profited by the success of Berber pirates. Mohammedan conquest accelerated their activities, because booty was derived from enemy infidels. Turkish control of Algeria, Tunisia, and Tripolitania encouraged the corsairs, Barbary piracy reaching its zenith in the seventeenth century. The United States took part in attempts to check them after the War of 1812, when the navy felt too powerful to remain idle. The French conquest of Algeria in 1830 marked the beginning of the real end of Saracen marine activities in the western Mediterranean. Once the most important center of piracy was subjugated, it remained for the introduction of the steamship to wipe it out completely. The Berber failed to adapt himself to the problems of modern mechanics and the steam engine.

From its Algerian nucleus, French influence later spread both eastward and westward, in part to keep pillagers and raiders from making excursions across French boundaries. Tunisia was occupied in 1881. Morocco, which had never been brought under effective control by Spain, was occupied in 1911. Italy, belatedly interested in colonies and particularly jealous of French control of Tunisia, wiped out the last vestige of Turkish suzerainty in Africa by taking Tripolitania and Libya in 1911-1912.

CULTURAL LANDSCAPES

Though Europeanization of Mediterranean Africa, in a modern sense, is little over a century old, it has produced widespread changes in landscapes. Berbers are still the most numerous people, especially in rural areas, though their stock is more or less mixed with Arabs. Nomadic Arabs occupy drier territory along the southern Atlas. Europeans form considerable parts of city popu-

lations and engage in agricultural activities along the coastal tell and in the most productive valleys. Tribal organization has given way to territorial systems in the north, and is rapidly doing so southward.

Tangier, a territory of 232 square miles and 60,000 people, is an internationalized port because its potential strategic value as guardian of the Strait of Gibraltar is so great. Spain has a fortified post, Ceuta, with an area of five square miles and population of 40,000, to the east of the gateway and directly south of British Gibraltar. Er Rif, Spanish Morocco, 18,009 square miles, 1 million population, is so little under European control that its interior is as yet unexplored. Iron ore is shipped from Melilla, mainly to England.

About half of the 10 million people of Morocco live on the Plain of Sbu, between Er Rif and the Middle Atlas range. Fez developed as the leading native trade city and agricultural center. The products of field agriculture include barley, wheat, maize, beans, linseed, and cumin seed. Orchards produce almonds, olives, figs, and oranges. Poultry raising is carried on intensively. Grapes grow along valley sides. The Meseta is too dry for agriculture without irrigation, but furnishes good range for cattle and sheep. Native industrialization includes the manufacturing of carpets, leather goods, fezzes, woolens, and silk goods. The leading exports are eggs, poultry, cereal, almonds, hides, wool, and phosphates which are mined near Oued-Zem, on the inner side of the Meseta. Mineral resources are not well developed, but include iron, copper, lead, and tin. Petroleum is produced near Fez. To the south are the higher Atlas ranges and their partially developed resources of animal products, lumber, and minerals; a potential vacation land.

Algeria is more Europeanized than Morocco. The tell is highly productive of wheat, barley, oats, maize, potatoes, artichokes, flax, and various fruits, including lemons, oranges, almonds, and figs. The vine thrives; wine is the chief export. Cotton, tobacco, cereals, and grapes are produced in several interior valleys. The Australian eucalyptus has been imported and is planted as an ornamental tree, as in many other Mediterranean-climate lands. Olives, cork oaks, and pines extend up to elevations of 2,500 feet. Various oaks, junipers, and cedars grow at higher levels. Dates and pomegranates thrive in drier locations. Fiber plants include a dwarf palm and alfa grass, useful for making straw hats, baskets, cords, matting, and similar products. Sheep are raised extensively in territory back from the coast or above agricultural valleys. Mineral resources are exploited to

a very considerable degree. Beni Saf, west of Oran, has iron similar to the ores of Er Rif. Zinc, lead, copper, antimony, and mercury are produced at various places. Tebessa, on the Tunisian border, is a significant source of phosphates. Forests furnish cork, tanbark and fuel. Sardine fishing is important along the coast. Sheep rank next to wine among exports, and important amounts of barley, olive oil, dates, tobacco, minerals, and alfa grass for paper-making are shipped, mainly to Marseille.

Tunisia's tell and Majerda Valley, which lends west from Tunis, produce about the same things as the agricultural parts of Algeria. Its Sahel olives are of excellent quality. Pistachio nuts, shaddockes (an inferior kind of grapefruit), henna, alfa grass, and dates are among its more important crops. The main exports are cereals, phosphates, olive oil, hides, cattle, and ores of iron, zinc, and lead.

Tripolitania has very limited areas of agricultural land. The Jefura Plain, along the coast toward the Gulf of Gabes, has sufficient precipitation for wheat, tobacco, olives, dates, lemons,

figs, almonds, and grapes. While summer drought lasts for over half the year, winter precipitation of even very limited amounts of water is extremely useful to plants. Wheat is raised successfully even where annual rainfall is as low as eight inches, because moisture comes when most needed and evaporation losses are at a minimum. The agricultural belt is only about twenty-five miles wide, behind which is about a thirty-mile strip of steppe. Alfa grass and grazing in the steppe provide raw materials for native industries, which include weaving of matting and grass rugs, carpet making, and the production of leather goods.

The Syrte Depression is too dry for more than minor agricultural productivity, as is most of Cyrenaica. In the plateau, where there is just about enough rain for field agriculture, Italians have made considerable progress in developing cereal crops and olives.

URBANIZATION

Mediterranean Africa had many ancient cities other than Carthage. It has retained important urban centers during all succeeding centuries. The effect of Europeanization has been to decrease the relative importance of old trade centers of the



Sultan's couch, Rahat (U.S. Army photograph)

interior and to increase that of the better ports and towns along the coast.

Casablanca, 570,000, is the outstanding beneficiary of modern times, having risen to the rank of third city on the entire African continent. Its growth has been so recent that it is one of the most modern and European cities in Barbary. The backwardness of Spanish Morocco has had much to do with establishing Casablanca as a gateway for European trade. Through it pass the phosphates of Oued-Zem, the agricultural produce of Moroccan lowlands, and most other exports. Industrialization is minor, other than that arising naturally in a city of nearly half a million, and includes agricultural processing plants, such as breweries. *Marrakesh*, once far larger, has a population of nearly 239,000. It is an interior trade city that has not progressed very rapidly during the modern European period, serving mainly as the commercial center of a fruit-growing district on the Meseta. Fez is a somewhat similar trade city for the Sbu Plain, its leading factories being flour mills. Rabat, home of the Sultan and capital, has tinneries and other agricultural processing plants. It serves as Atlantic port, as do Safi, Mogador, and Agadir. The latter three benefit by not being connected with railroads. Each serves a hinterland lacking reasonably good communication with the modern facilities of Casablanca. Agadir is the port for the detached, fertile plain of Sus, in the extreme west.

Algiers (Alger), 315,000, has an excellent harbor and is port of call for so many ships that other Algerian outlets are reduced to minor consequence as competitors. In some years its tonnage is equivalent to that of Marseille. Oran, to the west, handles local trade, Philippeville (the Phoenician *Ruscidae*), and Bone (old Hippo Regius), serve as minor ports for eastern Algeria.

Tunis, 200,000, dominates Tunisia much in the way that Algiers overshadows all other Algerian cities. The ruins of Carthage lie on the north side of La Goulette, an entrance from the Gulf of Tunis. Bizerte, not far away, is a French naval base, which was greatly resented by Italians because of location close to Cape Blanc, northernmost point of Africa, which is commonly within view of Sicily. Sfax, Gabes, Tripoli, Misurata, and Benghazi are comparatively minor ports eastward along the coast of Mediterranean Africa. Some of them have greater meaning to the Dry World than the larger, more Europeanized cities to the west.

SAHARA

Estimates vary as to the size of the great "wilderness" between the narrow Mediterranean strip

of Africa and the Sudan, between the Atlantic and the vicinity of the Nile; but in any appraisal the Sahara is a desert of continental proportions, roughly equivalent to the area of Australia or the continental United States.

In the main the Sahara is a region of unfolded rocks, a continental "shield" with rather uneventful geologic history. Faulting has elevated some blocks and depressed others. Volcanic activity accounts for the presence of some high plateaus and mountains. The proportion of exposed bedrock, however, is minor in comparison with extensive surfaces of desert deposits. Most of the surface is reg and extensive parts are erg.

Though invasions of the sea have taken place at various times in geologic history, most of the bedrock is of continental origin and indicates the presence of desert climatic conditions far back into geologic antiquity. There was a slight amelioration of aridity during parts of the Ice Age in the western Sahara, but evidence denies conclusively any significant climatic change during historic time. Ancient geographers described the margins of the Sahara where they exist today. Though Mediterranean Africa prospered and contained important cities, the Sahara was an almost impenetrable barrier between Mediterranean and African Worlds at the dawn of written history, as it is today.

CULTURE BACKGROUND

Sudan trade, from the vicinity of Lake Chad, across the central Saharan highlands of Air (Asben), along the Fezzan graben, to the western coast of the Syrtic Depression, is extremely old. This shortest and least-desert route between the Mediterranean and central Africa was known to Herodotus and used, in turn, by Greeks, Carthaginians, and Romans. Pliny knew at least two routes to the Sudan. Along them came gold, ivory, ostrich feathers, ebony, pelts of such animals as leopards, and slaves to the north, and went textiles, metal wares, salt, and dates to the Sudan. Along the sides of the Adjer (Tassili) Plateau are paintings and carvings of horse-drawn chariots dating from the fifth century, B.C.

Of all Saharan oases, the one best known to the Ancients was Gadames (Ghadames), with its excellent springs and artesian water supply. Greeks, Egyptians, and finally, Romans knew it, but none of them penetrated westward, across the Grand Erg Oriental, to the Algerian oases, nor far to the south. Ancient trade was carried on by stages, in which Sudan Negroes contacted

Saharan Negroes, who bartered with Garmanians (inhabitants of Gadames and its vicinity) or other peoples to the north. The Garmanians were Mediterraneans and are considered possible ancestors of the Tuaregs, who now rule the western Sahara. Ancient inscriptions show rather close contacts with other Mediterraneans, but as time went on Gadames became Negroified.

A major but short-lived thrust of Ancient Mediterranean civilization into the extreme western part of the Dry World occurred in 520 B.C., when Hanno set out with sixty vessels, each manned by fifty oars, with some 30,000 colonists from Carthage to colonize the coast of Morocco and the Atlantic coast of Mauretania. Some of the expedition probably reached lands south of the Senegal, because they encountered crocodiles, monkeys, and people with tom-toms. These Carthaginians had tremendous difficulties with a primitive group of people known as Guanches, who were probably early Berbers along the western coast. Ancient Berbers discovered and settled the Canary Islands, but had disappeared by the time the first Portuguese arrived. Only the descendants of their dogs and goats inhabited the islands.

The introduction of the camel brought the first really great culture revolution to the Sahara. This awkward creature, though more perfectly adapted than any other animal to the desert, was brought to Egypt only in 325 B.C., from Persia, for caravan use between Red Sea ports and the Nile. Horses of various kinds and oxen had been the traditional beasts of burden throughout north Africa and remained so in the Sahara until 47 B.C., when the Romans brought camels for trade with Gadames. The Garmanians readily adopted the new animal, as did people along the Tripolitanian coast. By 366 A.D. there were more than 4,000 camels west of Egypt. Camels are said to have been abundant in Byzantine Africa in 500 A.D. It was the camel that spread the Berber during the last fifteen centuries and drove the Caucasoid-Negroid frontier from the foot of the Atlas to the Sudan, where it is today.

The occupation of the Edeyen Erg, south of Gadames, was comparatively easy. This region now supports some 50,000 people and has many sources of water. Originally it was wholly Negroid, but Mediterranean Berbers and various mixed peoples live there today. With the Fezzan Oases to the south it has long served as one of the main commercial districts of the Sahara. Murzueh (Murzuk) was its administrative center during Turkish days.

The camel was brought west from Gadames in

the sixth century by a group known as Zenetic Berbers. Their main settlements were in the Touat Oases, west of Tademaït Plateau. These people were more or less Hebraic. Guarara, a short distance north of Adrar, was their original stronghold and their political control lasted at nearby Tamentit until the sixteenth century. Headstones were inscribed in Hebraic characters and their dialect, Zenatiya, is still spoken locally. Other Zenetes moved into Cyrenaica, where they are now considered Jews.

The Saharan Negroes had a Neolithic culture. Bows and arrows were their weapons of offense and they used stone mortars and pestles for crushing seeds, their main vegetable diet before the date palm was introduced into their territory. A remnant of these early people in the Plateau of Air (Asben), to the south of the Ahaggar, retain many of these old culture traits.

During the Middle Ages there were extensive Negro kingdoms, such as Songhai, Mandingo, and Ghana, in the southern Sahara. The Negroid populations to the north, in the western Sahara, were overcome by Tuareg Berbers who now occupy Adrar solidly. These irrepressible nomads graze camels in lands that could easily grow crops. To their east in Air, between Ifrouane and Agadez, are some 20,000 Negroes and mixtures of Tuaregs and Negroes who are under the control of a few white Tuaregs. The Elbow of the Niger, in the vicinity of Timbuktu is Tuareg and Songhai territory today. Some of the main Negro cities of the Middle Ages, such as Ghana, lie in ruins.

The principal Negroid Sahara lies to the east of Air. Its stronghold is in the Tibesti Massif in territory above 4,000 feet in elevation. Here live the Tibbu, some 10,000 homogeneous people who speak a central African language and still use throwing knives as skilfully as their racial relatives to the south. Many of their facial characteristics suggest Caucasoid blood, but whatever admixtures they represent took place long ago. To the south are the Borkou, possibly more numerous and certainly more Negroid, who speak practically the same tongue. Though these peoples live in places that are considered European, mainly French, territory, they are practically free politically and have retained their original cultures. The Tibbu lost the Kufara (Cutra) Oases in the late eighteenth century. Kufara means "pagan," a term applied by Mediterraneans who long ago knew of the existence of these remote peoples in the heart of the Libyan Desert, but who rarely found it possible to visit them.

The Tuaregs, who wrested the western Sahara from its original Negroid inhabitants, dress like Tibbu in that they wear the *litham*, a face veil.

which they never remove. The purpose of the veil is not that of shielding the face against the relentless rays of the sun or uncomfortable blasts of sand, but modesty or intent of keeping evil spirits out of the body. They sport arm bands of polished stone, use a Neolithic manner of attaching ax heads to handles, and refrain from eating a large lizard, the *uran*, which they consider as embodying the spirit of their maternal uncles. Other Saharan peoples relish that animal as food. The place of the woman in society is far better than that among Arabs. Vestiges of matriarchal rule and succession remain strong in their social organization. Though Moslem, they speak Berber and are unable to read the Arabic of the Koran, so feel the influence of Islam less strongly than most Arabs. The Arabs are their traditional enemies and their main forte has been conflicts with them. In spite of inferiority in weapons, Tuaregs have time and again exhibited their prowess, commonly raiding before dawn and fighting at close-quarters. As late as 1900 they appeared with armaments no better than antelope-skin shields, lances, and heavy swords without pointed tips. The Tuaregs are divided into many tribes, none of which has more than three or four hundred members.

Berbers from the Atlas Lands worked down the western edge of the Sahara at some very early date. The name Senegal is derived from a Berber group, the *Sanhajas* (*Zenagas*), who are now about extinct.

Arabic invasion of the Sahara proceeded westward along the foot of the Atlas ranges. Some settled along the Mediterranean coast and a few reached the Atlantic. Most remained nomadic in steppe lands, near oases, and as caravan traders, rather than adventurers into the wild Tuareg Sahara. Many of the best oases are owned by Arabs, who introduced the irrigation of date palms in the tenth century and have been extending it ever since. The work in oases is done mainly by Berbers and Negroes, who receive 20 per cent of the return. Arab owners, who appear about the time dates ripen and claim 80 per cent of the crop, maintain a kind of feudal system over the Saharan population under their control.

REGIONS

Mauretania, in its widest sense, the Sahara west of Wadi Zaoura (*Saura*). *Esh Shesh Erg* (west of Touat), *El Djouf* (*Juf*), and a line running southwest nearly to the mouth of the Senegal, is the least explored part of the Sahara. It is known to have some excellent oases inhabited by Negroid and Berber peoples, but their contacts with the

European World are almost nonexistent. The Berber population to the north in Morocco, the Almoravides, furnished the manpower that overran Iberia but became thoroughly Arabic and lost its identity. The Moors are cultured and literary as compared with other Arabic peoples. The Arabic *Regibat* and *Uled Delim* tribes, farther down the Atlantic coast, are among the most pious and ruthless robbers on earth. *Rio De Oro*, a Spanish possession supposedly administered from the Canaries, is practically unexplored and unknown to Europeans. *Villa Cisneros*, its sole village, is a refuge for bandits and a center for smuggling guns, ammunition, and other contraband. The French have been unsuccessful in their attempts to police it.

Algerian Sahara, between Mauretania and the Fezzan Depression, the central plateaus of Ahaggar and Air, and the borders of the Sudan, is the best-known part of the desert other than the strip from Fezzan to the Syrte coast or the immediate borders of Egypt. During the Ice Age precipitation was sufficiently heavy along the southern Atlas and in central Saharan plateaus that long wadies extended into what is now severe desert. Reg and erg materials were brought down by streams. For thousands of years the surface has lain barren and been worked over by winds. Most of it has become relatively smooth reg, but huge sand fields have formed. Old valleys are now much drier but there is considerable subsurface seepage, so that strings of oases follow the Ice Age stream courses.

The Zaoura (*Saura*) wadi system, on the west, lies south of Igli where the Wadi Susfana from the Saharan Atlas is joined by Wadi Gir from the High Atlas of Morocco. During occasional floods, waters now flow some 400 miles to upper Touat. During the Ice Age the flow continued much farther, into *Esh Shesh Erg* and the almost unexplored desert of *El Djouf*. *Beni Abbes* and other oases near the Atlas have springs and flowing water. Farther south it is necessary to dig for water. In the tenth century, *foggaras* or extensive underground water systems were constructed as far south as lower Touat. Astonishing amounts of labor went into the construction of the *foggaras*. Some are 230 feet deep. Those at Tamentit, in Touat, have a total length of twenty-five miles. Tunnels lead out in various directions for trapping water and large underground reservoirs were constructed to retain it. Vertical shafts for removal of rock and for ventilation dot the surface above the underground workings. There is considerable mystery about the origin of these western *foggaras*. Similar works are found in

Egyptian oases, and the worship of Ammon Ra, a ram god of Thebes who became Alexander the Great in one of his reincarnations, seems to have come to western Algeria along with the development of subterranean water resources. Of all the deities of Egypt, only the ram god found popularity in the Sahara.

To the west and south of lower Touat is *tanezrouft*, a territory without oases and lifeless except for occasional transients, either human or animal. To the southeast are the Tidikelt Oases, where irrigation was introduced during the thirteenth century but not fully developed until the eighteenth.

East of the Zaoura is the Grand Erg Occidental, about 300 miles long, parallel to Atlas trends, and about 100 miles wide. As a whole this tremendous sand field has moved westward, obliterating various wadi courses and shoving the Zaoura against the margin of a bedrock plateau, but this has taken place during thousands of years. Changes during historic time appear inconsequential. To the east is a reg route leading south from Ghardaia to El-Golea and across the Tademaït Plateau to In-Sahala and Tidikelt, east of which is the Grand Erg Oriental, somewhat larger than the great erg to the west.

Of the many Ice Age wadi systems that radiated from the high plateaus of the central Sahara, Wadi Ighargha was the most important. From the central Ahaggar it flowed almost directly northward for 620 miles, past Flatters and Lallemand, to the Algerian Shotts. Careful search has resulted in the conclusion that the waters of Ighargha, combined with those from the eastern Atlas, were unable to create a lake in the below-sea-level Shott depression that ever rose high enough to overflow into the Gulf of Gabes. Ice Age climate, though sufficiently wet to create the wadis, was not truly humid in the Sahara; it was not even wet enough to overcome the typical bolson (interior basin) drainage of desert regions.

Most oases north of Grand Erg Oriental are owned by Arabs who pasture their camels on the Tademaït Plateau and various other open ranges, including the better territories within the ergs. At Ouargla (Wargla), the most southerly, are springs and small lakes that are known to be as deep as 130 feet, many of which are brackish and have no use. Artesian wells are developed at some oases by very primitive means, pick-ax and bail being the native digging equipment in the hands of tribes who do nothing else. M'zab, with a population of 43,000, is a peculiar oasis to the west of the Shotts, north of Ghardaia. Water is

taken from holes in limestone up to 200 feet deep, camels and donkeys furnishing the lifting power. The inhabitants could not tolerate the economic disadvantages of their location were it not for the fact that adult males spend most of their life in Algerian cities as bankers and money lenders, returning with considerable sums so that they may retire in a spot considered paradise, where they practice their own peculiar brand of Mohammedan faith.

Oasis settlements, however small, are urban rather than rural in aspect. They are fortified trading posts with markets, cafes, dens of iniquity, and accommodations for reprovisioning caravans. Streets are roofed over between buildings several stories high, all composed of dried mud, ordinarily shaped crudely into brick. These *kasrs* are populated mainly by Negroes, *haratin* (cultivators), who are a residue of slave populations and in no way related culturally to the Tibbu or to original Saharans. There are some 50,000 of these people, who speak only Berber or Arabic.

Central Saharan Plateaux extend eastward from the outer margins of the Ahaggar to the Tibesti. Mt. Tahat, culminating peak of the Ahaggar, rises to 9,842 feet. Temperatures lower than 20° F. have been observed at an elevation of about 5,000 feet and an occasional blizzard sweeps across the uplands. Channels of Ice Age wadis lead radially in various directions: to the Shotts, toward the western *tanezrouft*, and toward the Niger. Tuareg tribes range these highlands, as well as such surrounding plateaus as Adijer (Tassili), Muidir (to the west), and Adrar (to the southwest). The healthiest and most scenic caravan trails to the Sudan pass through this territory. Gat, on the route south from Fezzan, is Tuareg-owned. Negroid population increases southward, in Air, but Tuaregs are their masters.

The southward continuation of the Fezzan Depression separates Tuareg Ahaggar from Negroid Tibesti where the highest volcano, Emi-Koussi (Emi Kusi), rises to 11,023 feet. Here the Tibbu retain a culture that was formerly widespread when the Sahara was mainly Negroid. To the north they still own the oasis of Gatron, but lost Cutra (Kufara) to Senusi Arabs. To the south they own important salt works at Bilma. The neighboring Borkou were invaded in 1820 by extremely unwelcome Uled Sliman Arabs, who originated along the Gulf of Sidra and suffered some severe defeats by Tuaregs before migrating southward.

Fezzan Depression, ancient Phazania, from Gadames, across the Hammada-el-Homra, to the gap between the highest volcanic regions of the central plateaux, retains its old racial mixtures

and commercialism. It is still the shortest route to the Sudan from the Mediterranean. Many of its people are trilingual, speaking Berber, Arabic, and Tibbu tongues.

Libyan Desert, between Fezzan Depression and the vicinity of the Nile, contains the largest erg and most inaccessible wastes in Africa. Much of its reg takes the form of rough *serir*. This region lacks the Ice Age wadi systems of the Algerian Sahara. It not only remained desert during the more pluvial period, but was also robbed by the Nile of drainage that might have come from the high Nubian (Arabian) Desert, between that river and the Red Sea. To reach *Cutra* (Kufara) from the Farafra Oases of Egypt is extremely difficult, requiring one 12-day march without water for camels, so the route is rarely used. The old trails from the north require a minimum journey a week long across featureless reg, where only stars serve as guides for maintaining route direction. Somewhat more accessible from the south, this area remained the northernmost outpost of Tibbu tribes for many centuries.

Sudan Borderlands extend from the Atlantic, past Lake Chad, to the main forks of the Nile near Khartoum (Omdurman), and cover with various degrees of completeness the transition to humid, tropical savanna climate. Negroid populations occupy most of the belt, the main stronghold of Caucasoids being in the vicinity of the Dry Bend of the Niger.

The upper Niger maintains a fairly direct northeast course to the vicinity of Goundam, near Timbuktu, where the elevation is about 885 feet. The river now swings around the great Dry Bend and in its lower course flows southeast to the Gulf of Guinea. Formerly its upper part continued northward into what is now El Djouf. The slope in that direction is about one foot per mile, Taoudenni having an elevation of 460 feet. At times of high water there is still considerable overflow across the Faguibine Lakes, along the old course. The great concentration of salt in El Djouf seems to have arisen in part from the evaporation of Niger waters, and in part from those of the Zaoura. The *tanezrouft* to the north and east is so severe that the salt basin is more accessible from the south than from other directions, thus cultural relationships are much closer to the Sudan Border than to the Algerian Sahara.

To the west of the Dry Bend are Arab tribes, centered in Mauretania. Some of these have invaded Tuareg territory toward Timbuktu, but the Dry Bend and most adjacent land has been wrested from Negroids by the Tuaregs. Tuaregs understand the necessity for agriculture in oases, because they are glad to have them as ports of

call, but the raising of cereals in the steppe borders is another matter entirely, providing opportunities for plunder. Under Tuareg control there has been a radical commercial decline along the Sudan borderlands. Timbuktu, once a city of 12,000, has dropped to about half that size and retains little importance. Upstream Djenne is now more significant as a commercial center. Since Middle Ages, Timbuktu served as headquarters for the *Trarza* salt works, deep in El Djouf, and since the seventeenth century for the slightly closer Taoudenni (Taudeni) salt supply. This trade in salt is one of the most barbarous on earth. Negroes are required to go to Taoudenni, where they are kept in bondage. Most of them die there, because the place is entirely unfit for habitation. Camels have been tortured and killed in numbers while bringing the salt back across the direct, but extremely difficult route through Araouan (Arawan).

Though the Dry Bend Tuaregs speak Berber and maintain most Tuareg traditions, they have had to adopt the horse because it is somewhat more resistant to tsetse-carried infection than the camel. For attack they use the *zagaya*, a casting weapon thrown with consummate skill from a horse at full speed.

To the east of the Niger the boundary between Berber and Negro influence is marked by the northernmost Sudanese villages and cities. Lake Chad, deep in Negroid territory, varies so much in size from year to year that there is terrific disagreement as to its size and shape on maps. The lake is fed by several large streams from the south, but is not a terminal basin. Its water is drinkable because outflow occurs across a marshy territory along its eastern border and seepages lead toward Bodele Depression, in the territory of the Negroid Borkou.

MODERN CULTURAL IMPACTS

The Sahara means very little to the rest of the world. If its entire population should disappear, few factory wheels would be slowed or steamer sailings delayed. Somewhat inferior dates would reach European markets for a few years, and a trickle of coal would cease flowing into Algeria from Kenatsa, on the Moroccan border slightly southwest of Colomb-Bechar. France would have its expense of colonial administration slightly reduced, and be spared many difficulties that arise from dealing with tribal peoples whose dispositions run to pillage, and who resent the European system of territorial domain.

To the Saharan the impact of European cul-

tures has been revolutionary, especially in Algeria where it came earliest and has been most effective. Many Arabs serve as *mehurists*, members of the French camel corps who enforce law and order in remote places. Over many important routes the old caravan speed of three miles per hour or less has given way to modern motor transport. European cloth and other supplies find their way even to the most primitive peoples. Date growing has been stimulated both by modern wells and higher prices resulting from increasing demand. Soldiers and officials contribute important sums of money to local trade. Tourists are finding novelty and attraction in desert landscapes. Hotels and warehouses line even such remote routes as the difficult one between Atlas Lands and Timbuktu. Above all, the novelty of as much as a century of relative peace has been established.

Least affected is the almost ungoverned Spanish territory in the far west. The French try to hold aggressive tribes in check along the eastern boundary of Rio de Oro, and have a military motor road extending from Tindouf to Atar for this purpose. Port Etienne has been established near Cape Blanco to exploit the Arguin fishing banks, which are said to be among the richest in the world. A tremendous demand for fish exists in the nearby African World which faces grave food-supply problems, especially since reduction in livestock by tsetse flies has become acute. Breton fishermen from France and Galicians from Spain are newcomers to the Dry World in a place where life is difficult. Barbed-wire defenses help keep the Uled Delim and other Arab robbers in check, but food and even drinking water have to be imported.

The population of the Algerian oases is in excess of 200,000. Some of the world's finest dates, *daglat nur*, are raised along the railroad leading to Touggourt (Tuggurt). The western string of oases, from Figuig along the Zaoura to In-Salish, has become a 745-mile "street of palms." Farther along, however, on the route from Lower Touat through Ouallen (Wallen) to Gao or Timbuktu, there is an equally long stretch without

water or places to stop. This western route from the Algerian oases to the Sudan border is used only when speed is essential. The more attractive motor road runs from Touggourt through Lallemand, Flatters, Wadi Ighargha, and along the plateaus west of Ahaggar, Timmissao, and Kildal. Numerous other roads have been constructed between eastern and western oases near the Atlas, and in the south toward Lake Chad and Nigeria.

The most important air routes lead southwestward, toward Dakar. Occupants of planes unfortunate enough to make forced landings can hope for little better than to fall into the hands of Arabs, who are more likely to hold them for ransom than put them to death.

Italians have built blacktop roads in the Fezzan to Gadames and Gat, and through the Libyan Desert to remote Cutra (Kufara).

The native Saharan may well emphasize the opposite side of the ledger. Only in such remote sections as Igidi and El Djouf, or far-off Tibesti, has the European kept from interfering with native cultures. Elsewhere, remote areas have suffered severe secondary impacts. Plantations established under European auspices in Anglo-Egyptian Sudan now supply the world's demand for gum arabic, causing the collapse of an old trade at St. Louis, at the mouth of the Senegal, with supplies coming from the remote northeast. Commercial ostrich raising in South Africa ended the Saharan caravan trade carrying plumes north from the Sudan. Widespread prohibition of slavery has ended immemorial prosperity arising from heavy tolls on slave transports across routes to Fezzan and other places where demands were heavy. Many oases in Fezzan and Air now lie decadent. The descendants of former slaves live in degenerate manners and those of their former masters have turned more seriously to pillage.

The future will probably witness further developments along lines already started. To Europe the territory of greatest potential development lies along the Sudan borderlands, where it may be expected that present Tuareg institutions will be replaced gradually by those calculated to restore earlier agricultural activity, and thus shift the Dry World boundary northward.

30: Egypt and Hamitic East Africa

Egypt, as constituted politically, has an area of 386,000 square miles and population of 20.7 million. Of this vast area, which is almost equal to that of Texas and New Mexico combined, only about 18,000 square miles, about half the area of Indiana, are actually useful. Some 13,600 square miles are under intensive cultivation; almost 2,000 are used by date plantations, canals, and roads; some 2,850 are occupied by the Nile, several small lakes, and some rather extensive marshes too wet for cultivation. The Nile extends through Egypt for 960 miles, about 700 of which lie below its first cataract at Aswan, the head of navigation on the lower course. Seacoast extends for 1,250 miles along the Mediterranean and Red seas, but the Egyptians at no time became a maritime people. Egypt has always had but two essential parts: the Nile floodplain which is not much over ten miles in width at any point, and the delta, a roughly triangular tract with a Mediterranean base of about 150 miles and inland depth of 100, extending south to Cairo. Practically the entire population is crowded into this kite-and-tail-shaped area.

PHYSICAL GEOGRAPHY

Egypt (Misr) extends eastward to the Gulf of Aqaba, the continuation of the Jordan Valley graben to the northeastern head of the Red Sea. Sinai Peninsula is a rugged, desert territory, culminating in Mt. Catherine at an elevation of 8,530 feet, the highest point in all Egypt, seldom visited though within about 200 miles of Cairo. There is considerable mineral wealth in Sinai, but it is difficult to exploit. To the north lies low sandy desert, crossed by a railroad between the Levantine coast and the Nile, but otherwise a difficult barrier.

West of the Gulf of Suez and Sinai are the northern spurs of the highlands of the Nubian, or Arabian, Desert. The divide keeps close to the Red Sea and rises southward, culminating in Mt. Erba, at an elevation of 7,274 feet, about ninety miles south of Egypt. Westward slopes are steep toward the Nile. Ice-Age wadies poured great

floods down their valleys. These torrents helped widen the fault-created trench of the Nile.

To the west of the Nile is the Libyan Plateau, with an elevation of 1,600 feet and less, which slopes westward to four unconnected groups of oases. Each lies within its own basin and depends on some local supply of water. Kharga, southernmost and connected by rail to Qena in the Nile Valley, and Dakhla to its west have a combined population of 25,000. Both depend on thermal waters that reach the surface through bedrock at a temperature of 102° F. Unimportant Farafra, to the northwest, with a population of less than a thousand, until recently was used only for grazing. Now it is planted to date palms. Like Baharia (el-Kasr Bawiti, Bawit), with 6,000 population, to its north, Farafra's waters are charged with gas. The development of Baharia started in the sixth century, when subterranean tunnels, much like the western Algerian foggaras, and wells were constructed.

The Libyan Plateau slopes northward into the lower Libyan Desert, where the Qattara Depression includes several small oases, such as Gara, Areg, Djarabub (Giarabub), and the famous Siwa, with its ancient temple of Jupiter Ammon.

The low Mediterranean coast of Egypt is desert and harborless. The delta coast is shoal, and Nile channels were long hard to enter. Only Alexandria offered a satisfactory harbor and comparatively safe approach to the commerce of Egypt. Here was erected the world's first lighthouse in about 300 B.C.

The Nile Valley was deepened more than 300 feet below its existing level during the Ice Age, when the Mediterranean stood low. About 30,000 years ago, ice began to melt in sufficient volume to raise sea level, and the Nile began the period of alluviation now in progress. For about the last 8,000 years, people have been training Nile waters to spread their silt for agricultural use.

For its last 1,700 miles the Nile receives no perennial tributary inflow. The Athara, which rises as the Takkaze in high Abyssinia, is the last stream to contribute water at all seasons. Still

farther south is the junction of the major Nile tributaries, the Blue Nile (Bahr el Azraq) and the White Nile (Bahr el Abyad). The White Nile rises south of the equator and is amply supplied with water. South of Kodok (Fashoda) it crosses an extensive flat area, where it spreads sluggishly into broad marshes with many channels that tend to be clogged by vegetation. Flow is comparatively uniform from season to season, and Egypt draws from it a dependable supply of water. The waters are greenish with microscopic plants and are considered unhealthy. The Blue Nile and Atbara depend on Abyssinia's monsoonal (seasonal) summer rains, which furnish huge volumes of water for relatively short periods and comparatively little at other seasons. These waters are reddish and laden with silt. They have made life possible in Egypt for many thousands of years. The Nile in Egypt is lowest in April and May. In late June (traditionally on the 22nd) it rises abruptly. For the first two or three days the waters are greenish and unhealthy, but the reddish water follows, ordinarily rising to maximum stage in October. By November the flood season is likely to be over. At Cairo the flood rises as much as thirteen feet.

The Nile dwindles in volume as it crosses



Egypt: index map

Egypt. The annual precipitation along its valley is on the order of one inch, which doesn't even begin to compensate for losses due to evaporation, let alone those that result from waters withdrawn for agricultural purposes. Today the Nile is a highly artificial river, and very little water ever reaches the Mediterranean through the channels of its delta.

CULTURE BACKGROUND

Second only in size to Mesopotamia as an oasis in the Arab-Berber Realm, Egypt is an isolated land that has been spared conquest, invasion, and unpleasant outside contacts to a remarkable degree. To its west is one of the largest practically uninhabited tracts of land on earth, the broad Libyan Desert with its impassable erg and serir. To the east is the rugged Arabian Desert, with its abrupt eastern face rising from a shoal and treacherous sea, almost without ports today. To the north is the broad Levantine end of the Mediterranean, but inhospitable delta coast and coastal marshes intervene. The Isthmus of Suez offers difficult and hostile access to the right flank of the delta. It was used only occasionally by the Ancients, and even today is so worthless that the political boundary of Africa lies east of what appears a better physical separation. Oases leading through Siwa furnish a difficult route from the west. Siwa today marks the boundary between Shark, the eastern, and Gharb, the western divisions of the Mohammedan World. Above Aswan, the Nile leads south through a desert of ancient rocks, crossed by eight layers resistant enough to form rapids, or cataracts. Still farther south are broad savanna marshes. These barriers were so formidable that the ancient Egyptians remained thoroughly ignorant of the sources of the great river upon which their whole culture and individual lives depended. Thus circumscribed, Egyptians remained aloof. They were little influenced by cultures or ideas from any side. Phoenicians, Greeks, and Romans appeared among them, or carried on their Mediterranean commerce, but Egyptians themselves stayed at home, living according to their own peculiar cultural traditions.

Both ancient and modern Egyptians are predominantly Mediterranean racially. It is estimated that 80 per cent of the present population is descended from the peoples who built the pyramids and developed the earliest irrigation systems. Few Egyptians have migrated to other lands. Most of them have remained downstream from Aswan, though ancient monuments extend as far up as Merowe, near the fourth cataract. In the twenty-

sixth century B.C., a fort was erected at Aswan, "Keeper of the Door of the South." Products were exchanged with Ethiopians, who lived to the south. Gold, silver, ostrich feathers, ebony, ivory, and panther skins came from the Sudan. Himyarites from southwestern Arabia or the Somali coast brought wood, resins, gums, and products from India and the East Indies. Possibly as early as 4000 B.C., tin, probably from Malacca (Malay Peninsula), was reaching Egypt, along with myrrh, and indigo for dyeing mummy cloth. Phoenicians prospered from Egyptian trade, conquering Cyprus in the eleventh century B.C. largely to get copper and forest resources for nearly woodless Egypt. But Egyptians remained culturally unmixed, holding tenaciously to their ancient Berber tongue.

Boats were used on the Nile as early as 6000 B.C. By 2900 some were as long as 170 feet. The construction of these craft was a difficult undertaking in a land with few trees. Short planks were fashioned out of wood from acacias, small trees at best. Smaller skiffs were nothing more than bundles of papyrus, the sedge whose pulp was sliced and pressed into a kind of writing paper, and which also served as the most common fuel.

The Egyptians were greatly interested in foreign lands and their products. Hannu is generally considered their first explorer. He left Egypt in 2750 B.C. for the mysterious land of Punt and worked southward, along the coast of the Red Sea and some distance beyond the Strait of Babel-Mandeb.

Kosseir (Quser), 100 miles east of Thebes, was an important port by 2000 B.C. Commerce so flourished that Thebes became the capital of Egypt, 1935-1887 B.C. From India came ivory, gold, perfume, cinnamon, sandalwood, myrrh, muslin, peacocks, and apes. From the Himyarites (himyar means red; Arabs from the Red Sea) came tall tales of hardships at sea and difficulties of Far Eastern trade that awed the home-staying Egyptians, and encouraged them to pay fancy prices for imports.

King Necho, 600 B.C., chartered a Phoenician fleet to sail around Africa, which was done in three years, returning through the Pillars of Hercules into the Mediterranean. Strabo, Greek Geographer at the time of Christ, discounted Herodotus' belief that the mission was a success, but the very evidence that Strabo used against the probability of the voyage is actually rather good proof the trip was completed. Coasting and landing to plant crops when food was needed, as was the practice of ancient navigators, the expedition encountered tropical heat, reversal of seasons, and found that sunrise changed from the

port side of their ship, during the early part of the trip, to starboard later on as they sailed northward along the Atlantic coast.

The earliest attempt to connect the Nile with the Red Sea occurred in 1900 B.C., along a route following the eastern delta channel and wadi Tumilat to Heroopolis (Pithom), some twenty-three miles west of the existing Ismailia, which was then at the northwestern head of the Red Sea. Other attempts were made in 1380, 609 (completed about a century later), 285, and A.D. 98 and in 640. These canals were generally used for only short intervals and then allowed to deteriorate for the reason that the northern end of the Red Sea was dangerous water, full of shoals and subject to drops of three feet in level when winds blew persistently from the southwest (summer monsoon). The steadiest trade remained with Punt to the south, overland from Kossier and other ports east of Thebes, and with distant Berber above the fifth cataract of the Nile.

Mediterranean trade always centered along the Canobic distributary of the Nile, a left fork leading toward Alexandria. Naukratis, in the vicinity of existing Damanhur, was made a treaty port in 620 B.C. Alexandria was founded in 330 B.C., and is the only survivor of a great many cities by the same name founded or named by Alexander the Great. It was Greek and remained so for many centuries. To Mediterranean lands, Egyptians sent wheat, canvas, and linen. In return came wine, lumber, copper, and purple and saffron dyes. Wood was in particular demand, not only for building but also for use as incense.

The sedentary Egyptians were always the masters of the nomads with whom they came into contact, a condition almost directly contrary to that in Mesopotamia, the other great Arab-Berber Realm oasis, where the population was generally servant of the nomad who first appeared from one direction, then another. Protected Egypt remained free from the ravages of the barbarian, and isolated enough from its impoverished neighbors to develop a high degree of civilization, which was maintained for a tremendous interval of time. Its Bedouins today, as in the past, are peaceful caravan traders, or in a modern, somewhat degenerate form, serve as guides for tourists to the pyramids. Only rarely have Egyptians extended their nationalistic ambitions beyond the Nile Valley for any considerable distance. In general they have remained among the least aggressive of all peoples. Even when accepting the religion of Islam, they refrained from wielding its sword.

AGRICULTURAL HISTORY

Irrigation began in about 5000 B.C. and assumed great importance under King Menes, in about 4000 B.C., when basin irrigation was introduced. Under this ancient system tracts from 5,000 to 50,000 acres in size were surrounded by low dikes, and flooded to a depth of as much as three feet in August, water being permitted to stand on the ground for a month or two. Millet, wheat, barley, and other crops were planted in October and November, to be harvested in April or May. Between spring harvest and autumnal flooding the land stood fallow, cracking to considerable depth under the parching summer sun. The basin irrigation system had many advantages. Flooding brought silt, as well as soil moisture. Fertilizing was unnecessary. The summer drying had an excellent tilth effect. This old system is still in use south of Deirut (Dirut).

Originally it was applied only along the left bank, but in 1380 B.C., some land along the right bank also came into use. One may note on detailed maps that most of the villages of Egypt still lie along the left bank, railroads are concentrated there, and right-bank population is comparatively sparse. Higher right-bank territory was harder to bring into production. Water generally had to be lifted by primitive methods, such as screws turned by the Nile current, water wheels that lifted small buckets to be emptied into flumes, or dipping buckets attached to balancing poles, operated by hand. Many of these devices are still in use.

A system of perennial irrigation was initiated in A.D. 1820. Weirs were extended into the Nile to divert water into ditches that led downstream to fields. Later dams crossed the river, to raise water levels so that higher ditches could be used and more land brought under production. The main contrast between this new system and basin irrigation is that the water is used only when



Cotton field, Egypt (U.S.D.A. photograph)

plants need it, during their actual season of growth. Instead of the traditional fall planting and spring harvest, crops are raised two or three times per year in the same field. Cotton, rice, sugar cane, and maize became summer crops. Under the system of perennial irrigation water can also be diverted to date groves. The main disadvantage lies in rapid decrease in productivity. Nile silt is no longer so evenly distributed over the land. The beneficial cracking during the summer is lost. It has become necessary to introduce a system of plant rotation and to fertilize soils. Clover and beans are being raised in increased quantities, because of their beneficial effect in supplying usable nitrogen for other crops. Long-staple Egyptian cotton brings high prices in world markets.

Cotton realized its first great impetus during the War between American States. With the failure of the American supply, English markets turned to Egypt, and cotton has remained the leading cash crop ever since. Yields are high, averaging some 400 pounds per acre. In most years Egypt ranks only behind the United States and India as producers of raw cotton. Practically the entire crop is exported.

Some 6 million acres are now under irrigation. A dam (barrage) below Cairo has converted the lower Nile into a lake 60 miles long, from whence water is drawn at will for perennial irrigation in the delta. The British built the 143-foot Aswan dam, which backs waters almost to Anglo-Egyptian Sudan, and additional dams at Isna (above Luxor, Luqsor) and Asyut. Navigation is possible along the entire Egyptian Nile because canals and locks lead around the dams. There was considerable difficulty in educating the Egyptian peasant, *fellah*, to the proper use of perennial irrigation. Long accustomed to extreme deficiency in water supply, he was inclined to use too much water, drowning the roots of his crops, as well as washing from the soil the more soluble nutrients needed by plants. Per-acre yields dropped for some twenty years, and though they have turned upward, production has never attained the levels reached in the days of basin irrigation.

Egyptian agriculture is still comparatively primitive. Water buffalo plow the rice fields of the delta, as in Far Eastern lands, and oxen are widely used as draft animals, for plowing and pumping water. The desirable combination of ample heat, sufficient water, and dependable harvest season is one that produces relatively good yields, in spite of backwardness in adopting modern farming methods. As farm animals the modern Egyptian has donkeys (asses), oxen, some

horses, and a few sheep, as had his ancestors since the dawn of recorded history. Most sheep and camels belong to nomads.

Cotton, wheat, maize, barley, rice, beans, and sugar cane are the main crops, but the population is so dense that Egypt is unable to feed itself. Rice is imported in large quantities, along with other foodstuffs, wood, coal, cotton cloth, and manufactured goods.

POPULATION

Egypt has always been a land of extreme luxury for a few and dire poverty for most of its people. The builders of the pyramids were hordes of laborers organized socially much like colonies of ants. The myrrh, gold, dyes, ivory, perfume, and other main imports in ancient times were for limited numbers of people at the pinnacle of the social scale, people who enjoyed the luxury of formal gardens as early as 2800 B.C., who remained in the shade, and eventually rested in magnificent tombs. Little in the way of a middle class developed except at foreign Alexandria, one of the brightest spots of the Ancient World educationally and socially. Conditions are not so different today. The great mass of the population, the *fellahs*, live in crude mud huts as tenant farmers to whom luxury is unknown. As in many other parts of the world, an extremely productive region leads not to general prosperity, but to poverty for the masses.

The population, 20.7 million, has increased fourfold during the last century. It is 91 per cent Mohammedan, 8 per cent Christian, and about 0.5 per cent Jewish. Rural densities range to 1,500 per square mile. Villages are numerous; cities are few, only two having attained first rank.

Cairo, 2.1 million, is the largest city in Africa. Its site is the most advantageous in Egypt and is located near the original Memphis, the traditional capital of Lower Egypt, which was a short distance to the south across the Nile on the left bank. Cairo is the head of the delta, not far from Suez, Ismailia, ancient Heroopolis, and other places at the head of the Red Sea which could be reached by easy overland routes or by various canals. Distributary channels radiate northward through the marshes of Lower Egypt. The one main route to the west, through Siwa and Augila to Cyrenaica, Gadames, or Fezzan, started there, so that Memphis was a crossroads and nodal point for ancient commerce. Cairo has the advantage of solid footing, at least the higher parts of the city being above the flood plain. The present city was founded in A.D. 968 but near it are the

Pyramids and a territory associated with some seventy centuries of history. Within easy reach are both Upper and Lower Egypt, reg. erg. and the Fayum Depression, over 140 feet below sea level. As capital and largest city in the Mohammedan World it is an important political center. Economic activities are commercial and financial, rather than industrial. Climate and tourist attractions contribute heavily to its income. In Oriental and non-European fashion, there is the sharpest possible contrast between a modern, comfortable, and attractive luxury quarter and the squalor of a large native section.

Alexandria, 0.93 million, second city of Africa, is the main port and commercial outlet of Egypt. With a protected harbor at the extreme western edge of the delta, it escapes silting and uncertain channel difficulties of most Mediterranean river mouths. Romans, by destroying its original Greek library, ended much of its educational leadership. Arabs completed the job in attempting to stamp out infidel culture. Alexandria, however, remained important commercially. The Voyages of Discovery and the appearance of the Turk were severe blows. When trade turned to the Atlantic, commerce along the Red Sea and across Egypt through Alexandria to the Italian and other commercial city states ended and Alexandria became a remote port on a commercially stagnant inland sea. The opening of the Suez Canal, in 1869, led to commercial revival as in Marseille and various other Mediterranean ports. The British, who police and protect but only in part own the canal, have established an important naval base as well as supply station at Alexandria.

Port Said, 178,000, at the northern end of the Suez Canal, is a naval base, port of call, and railroad terminus. The canal—104.5 miles long, 196 feet wide, and 34 feet deep—is used by about 5,000 steamers per year. Each takes an average of 11 hours 31 minutes in transit, through low, sandy desert, saline flats, and old lakes. The canal is paralleled by a railroad, leading to Suez at the south.

The construction of the Suez Canal resulted in the decline of several old seaports along the Egyptian coast of the Red Sea. Kosseir is now unimportant and Berenice, which served a route to Aswan, lies in ruins. Cisterns that long stored waters for a large commercial population are now dry. Caravan trails leading to the Nile are rarely used. Inland Thebes, long important as a commercial junction, lies practically in ruins. Aswan has maintained itself for entirely new reasons; namely, the cataract, dam, and railroad ter-

minus. Only from Aswan northward is land intensively cultivated.

ANGLO-EGYPTIAN SUDAN

Beyond the "Door of the South" lies a country about two and one quarter the size of Egypt, with little more than one quarter its population. Anglo-Egyptian Sudan flies both British and Egyptian flags because it is administered jointly by the two nations. Its almost 970,000 square miles are mainly uninhabited desert, barren steppe, or savanna-climate marshes. From a population estimated at 9 million in 1884 came a drop to 2 million under Dervish rule and tyranny, and conditions so horrible that the British felt prompted to take charge in 1898. The population has risen to 8.3 million and is increasing rapidly, principally along the White and Blue Niles. Habitation is almost nonexistent in the northwest in the Libyan Desert, or in the northeast in the Nubian Desert.

In the south is Bahr el Ghazal, where the White Nile is navigable for about a thousand miles through sparsely inhabited marshes. Here river boats proceed along channels, often clogged with vegetation, to maintain communications between the Berber Dry World and Negroid African tropics. To the southwest are Negro cultures, but only small populations. To the north are the cataracts of the Nile, scattered along a distance of 800 miles. Wadi Halfa, at the second cataract (upstream), is the boundary of Egypt.

Ancient isolation of Anglo-Egyptian Sudan was somewhat less perfect than that of Egypt. Severe desert limited contacts with Saharan peoples to the west. Egyptians penetrated along the Nile and a thriving trade was established with Himyarites at several ports in the vicinity of Suakin, leading overland to Berber and down the Nile, but the culture of Egypt had rather little effect on the Berbers, Half-Hamites, and the Negroid populations to the south who were traditionally regarded as Ethiopians and members of another culture world.

The British access to Anglo-Egyptian Sudan is from the Red Sea. Though Wadi Halfa is the terminus of a railroad to the north, it is not connected with the Egyptian rail net except by river steamers. Port Sudan offers modern harbor facilities and shares with Suakin a rail line leading to Atbara (near Berber) and the Anglo-Egyptian railroad system. Severe desert, savanna marshland, and Abyssinian slopes isolate this part of the Sudan from directions other than the Red Sea.

Gum arabic plantations in Darfur to the west and on Kordofan Plateau supply practically all

the world's needs. This enterprise has killed a former western Sahara supply and seriously crippled Arabian sources. Rail connections at El Obeid furnish transportation that is far cheaper than caravan haulage to Saharan St. Louis or the Arabian coast. Vegetable ivory for buttons, beads, or similar objects, and various groundnuts are produced in the more tropical, southern part of the country, from whence also come true ivory, animal skins, mahogany, and other tropical woods.

Extensive steppe regions north of Kordofan support a nomadic population, with camels, sheep, goats, and cattle. Hides are a fairly important item among exports. In the Gezira Plain, between the White and Blue Niles, nomads are being displaced by agriculturalists. The Makwar Dam, erected at Semnar in 1925, furnishes water for irrigating cotton and other crops. Egypt, however, has first call on Blue Nile water, and agricultural development can occur only to a degree not harmful to people farther downstream. As most of the Geriza district is located in latitudes lower than 15° N., cotton is grown as a winter crop when Egypt least needs water. The great Gebel Auilia (Gabel Awila) Dam, 27 miles south of Khartoum, is a new source of irrigation waters and is over 16,400 feet long. Farther down the Nile the agricultural population is narrowly confined. Five cataracts interfere with communications, and the river bend extending from Merowe to Wadi Halfa lacks railroad service. This region is true desert, without communications east or west because its flanks are almost uninhabited.

Kassala, on the Eritrean frontier east of Khartoum, has ample rains and has been agricultural for many years. Its cotton surplus leaves on the railroad leading to Port Sudan. Tokar and the

plain along the Red Sea, north to Port Sudan, now raise cotton to supplement dates, long the principal crop.

A number of picturesque old ports along the western shores of the Red Sea were important in Antiquity and during the Middle Ages. Though famous for fine architecture and rather lavish use of wood imported from as far as Java, they lie in decay. During recent years several ports of Anglo-Egyptian Sudan have been reviving. Port Sudan, especially, is a place that seems to have a prosperous future. It is now significant on account of its trade in gum arabic, cotton, dates, and various other products including local sea shells, a source of mother of pearl. More impressive growth, however, will come with the development of the interior. Rapid strides have occurred so far this century and Anglo-Egyptian Sudan seems destined to become the home of a large, commercial population who will export increasing amounts of cotton, cereals, and various other items.

Khartoum, political and commercial center of the interior, lies at the northern end of the agricultural Gezira. It is now free of long rampant malaria which gave the place a bad reputation. It is not a pleasant place for Europeans. The coolest month has a temperature averaging almost 70° F. and the warmest, May and June, are in the neighborhood of 92° F.

ETHIOPIA

Ethiopia (Abyssinia), 350,000 square miles and 15.0 million population, is a plateau, most of



Cotton caravan, Anglo-Egyptian Sudan (U.S.D.A. photograph)

which is over a mile high. Considerable area lies above 10,000 feet. Ras Dashan reaches up to 14,960, Mt. Kollo to 14,107, and Birhan to 13,629. This vast highland, one third larger than Texas and with twice the population, is the most extensive well-watered region in the Dry World. From the climatic standpoint it is humid territory, with some places having more than sixty inches of precipitation annually. Rainfall is sharply monsoonal, with July and August as wettest months and January ordinarily rainless. In spite of fertile, volcanic soils and ample precipitation, Ethiopia is culturally part of the Arab-Berber Realm of the Dry World. Its people generally prefer raising livestock to agriculture. They are mainly of Hamitic stock. Their cultural affiliations are with the north, rather than with Negroid Africa.

As in other tropical territories, elevation is a dominant factor in determining landscapes. Land

below 5,000 feet yields ebony, bananas, rubber, tobacco, coffee, and other tropical crops. Skins of leopards and monkeys supplement an export of hides of cattle, sheep, and goats produced in the highlands above. Dates, cotton, and sugar cane occupy the best agricultural lands.

In the next zone, extending upward to slightly over 8,000 feet, grow cereals and other Mediterranean products. Much of the land is too rough for agriculture, however. Vast stretches are covered by bamboo and other tall grasses. Millet and wheat occupy the best lands.

Still higher are the pasture lands, producing not only hides, but many sturdy little horses demanded by outsiders for polo ponies, donkeys, and mules.

Though considerable mineral wealth is known to exist, it remains undeveloped. Industry has advanced little beyond making hatchets, spears, and knives from local iron. Coal, copper, gold, and various salts are mined to some extent. Sulphur is produced in small amounts, and some

parts of the country are thought to contain petroleum.

As ancient Axum, Ethiopia was a protectorate of Rome. This accounts for much of its cultural affiliation with northern lands, as well as the tenacity with which many of its people have retained Christianity, though surrounded on all sides by Mohammedans. Its Coptic faith has been closely associated with that of Egypt, although under recent Italian control the two churches were declared separated. Addis Ababa has been a center of Christian influence since the fourth century. Harrar, to the east, is a center of Moslem and Arabic influence.

Government has traditionally been tribal, and is practically that today. The ruling class has been Semitic in speech and culture and Christian, but the lesser peoples



Northeast Africa: index map

are quite solidly Hamitic and many are Moslem. Now and then some ruler has extended his leadership widely enough to be dignified by titles such as king, or even emperor, but this should not be construed to mean that any chieftain has ever attained complete control, or that governmental organization has ever been perfected. Practically no schools exist, and all but an extremely few people are illiterate. Territorial boundaries have been drawn wherever Europeans have cared to locate them.

To colony-poor Italian governments, Ethiopia seemed a tempting land. Invasion of the northern part of the country was checked by King Menelik, in 1896, who amassed a following of some 60,000 poorly equipped warriors. The latter hid along what the Italian army of some 12,000 thought to be the route of retreat of a small native force. After the Italians were extended and in poor defensive position, near Adowa (Adua), the Ethiopians appeared en masse and annihilated them. The sting of this defeat turned Mussolini's thoughts toward Ethiopia, which he conquered with little difficulty because of vastly superior weapons, an act deemed worthy of raising the title of the Italian king to emperor. This "empire" lasted five years until 1941 when Ethiopia was freed by British forces.

The sole railroad leading into Abyssinian highlands runs 478 miles, from the French port of Djibouti (Jibuti) to Addis Ababa. Some trade by steamer occurs along the Nile, to Khartoum. There has been comparatively little development of a land that offers many opportunities. The absence of the tsetse fly permits the use of draft animals for plowing its excellent agricultural lands. The Tana Basin and several other areas could be highly productive, but the Ethiopian would rather cling to his Dry World ways and disregard the many resources that Europeans appraise highly.

ABYSSINIAN BORDERLANDS

Lowlands and low plateaus, extending along the southern end of the Red Sea, across the horn of Africa, and along the Indian Ocean coast to the mouth of the Juba River, form the easternmost African parts of the Arab-Berber Realm. Politically Italy has owned Eritrea, which runs nearly to the Strait of Bab-el-Mandeb and extends inland nearly to Kassala, in Anglo-Egyptian Sudan, north of Ethiopia. France has a small Somaliland colony located at a very strategic place, on the African side of the Red Sea opening. British Somaliland runs a considerable distance along the Gulf of Aden. The tip of the

horn and a rather broad belt along the coast to a short distance beyond the Juba were included in Italian Somaliland.

Few places are more unattractive than the Eritrean coast. Extremely hot, deficient in precipitation, malarial where water is present, and almost uninhabited, it offers little inducement to the colonist. Interior Eritrea is somewhat better land, but the entire population is not much over 600,000, hardly 4,000 of whom are Italians. Italian interest in Eritrea started in 1870 with the purchase of Asab, a small port near the Strait of Bab-el-Mandeb. Land to the north came under Italian control by 1890, as a part of the scheme of colonial expansion so abruptly halted by King Menelik in 1896.

Massawa (Massua), the main Eritrean port, lies almost due east of Khartoum, and is a potential trade outlet for the eastern Sudan. A railroad ascends to Asmara, the political center, at an elevation of 7,765 feet, and extends westward for most of the distance to Kassala. Gold and other metals exist, as in Ethiopia. Petroleum has been discovered near the Red Sea, as at various other points to the north, along the Egyptian coast.

French Somaliland, 9.1 thousand square miles and 48 thousand population, has little colonial significance other than that attached to Djibouti, its principal city and port. Here terminates the railroad from Addis Ababa, and arrive hides, coffee, ivory, and other products to be transported on ships.

British Somaliland, 60 thousand square miles and 500 thousand population, exports hides, resins, gums, cattle and sheep from Berbera.

Italian Somaliland (Somalia), 194 thousand square miles and 1.3 million population, has 1,100 miles of coastline. A short railroad leads into the interior from Mogadiscio, its chief port. Vegetable oils, gums, hides, kapok, ivory, resin, and half of the world's supply of incense are its main exports. Cape Guardafui lies at the tip of the horn, but Ras Hafun, slightly to its south, is actually a bit farther east.

The Abyssinian borderlands are unattractive areas of steppe climate, comparatively poor soils, and scrub forest. Their mixed Negroid and Mediterranean populations are mainly Hamites culturally and Mohammedans. Some of the Hamitic tribes, such as the Galla, are pagan. Though dark of skin and often strongly Negroid, the people do not take kindly to agriculture, preferring to live according to the manner of Dry World nomads and gatherers of such vegetable products as grow without cultivation.

31: Asiatic Arab-Berber Realm Territories

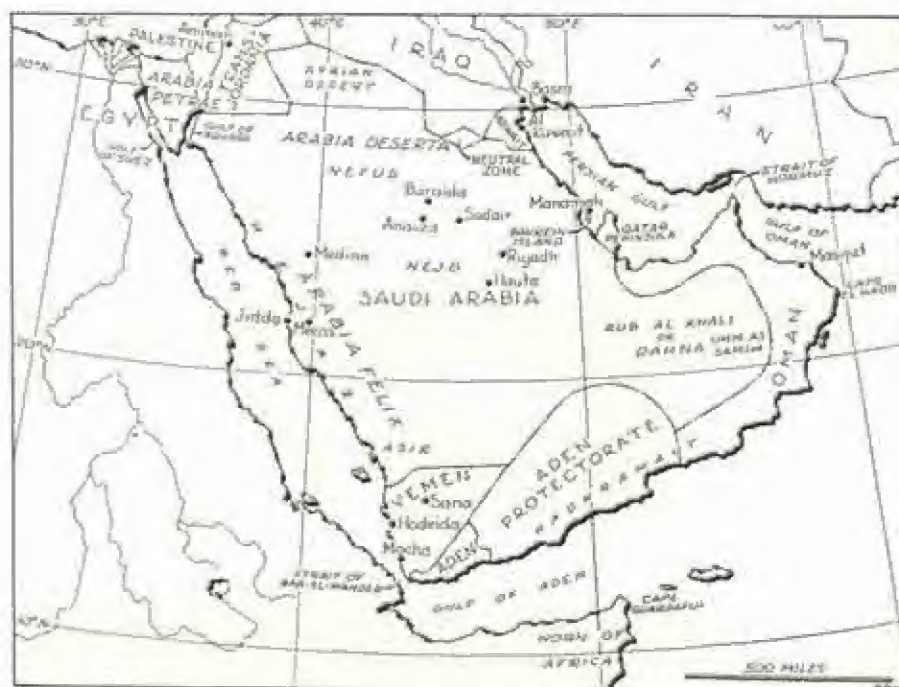
Arabia, 1,35 million square miles, 10.0 million population, is an area about 1.5 times that of Greenland, one third of the United States, or nearly four times that of Texas, with less than twice the population of Texas or less than the state of New York.

Traditionally it had three parts, one of which, Arabia Petraea, the highlands toward the head of the Red Sea, is now lost to Egypt and Transjordan. Arabia Deserta, also in the north, slopes toward the Syrian Desert and the upper Persian Gulf. The rest, and most of the large southwestern peninsula of Asia, was known as Arabia Felix: happy, or blessed Arabia. In recent years the latter designation has been applied more specifically to the Red Sea coast, or even restricted to its southern part.

Arabia Felix, in the traditional sense, has several parts. Elongate Hejaz extends from the head of the Gulf of Aqaba (Agaba, Akaba) for about three quarters of the distance to the Strait of Bab-el-Mandeb. Small Asir continues along the

coast to somewhat larger and vastly more important Yemen, at the southwestern corner of the peninsula. British Aden, on the Gulf of the same name, is minute. Hadhramaut occupies somewhat more than half of the south coast. Oman, to its east, extends around Cape el Hadd along the Gulf of Oman, Strait of Hormuz, and the Persian Gulf beyond Qatar Peninsula. The most significant part of the interior is Nejd, between barren Nefud of Arabia Desert and the larger and equally desert Dahna, or Rub al Khali, of Oman.

From the geological standpoint most of Arabia is part of Africa, separated by the Red Sea graben. It continues the high elevations of Egypt's Arabian, or Nubian, ranges and plateaus, and is composed of the same old and slightly folded rocks. The highest parts of Arabia lie rather close to the Red Sea. The rest of the peninsula slopes gently eastward and finally passes under the alluvium of Mesopotamia and the waters of the Persian Gulf. The highest points near the Red



Arabia: Index map

Sea are in the south, toward Yemen. Jebel Hada attains an elevation of 8,924 feet. Summits rise above 5,000 for nearly half of the distance between the Gulf of Aqaba and the Strait of Babel-Mandeb.

The exception to the general rule that Arabia is geologically part of Africa lies in the extreme east. Eastern Oman is a mountainous region of highly-folded rocks, resembling those of Persia (Iran) to the north. Jebel Sham, highest peak in all Arabia, rises to 9,902 feet.

During the Ice Age, Arabia, like the Arabian Range of Egypt, the Ahaggar, or the Saharan Atlas, had somewhat more pluvial climate. Wadies cut channels through rocky uplands and spread their deposits across lower territory. The most important water courses headed along the divide just east of the Red Sea. They plunged with force toward the sea, carving a rugged terrain in western Arabia. Somewhat less rugged surfaces were cut toward the east, where slopes were gentler. A few wadies managed to flow the entire distance to the Persian Gulf. Others reached only part way. Reg and erg surfaces have developed on wadi deposits during the thousands of years since the pluvial period. The proportion of erg may run somewhat higher than in the Sahara, but this is a bit uncertain. Some years ago interior Arabia was generally described as if it were mainly sandy desert. Maps now show less sand, especially in parts that have become better known. The more we learn about deserts the less sand we find in them. There is certainly much sand in Arabia. The few Europeans who have crossed parts of the little-known "empty quarter" at the southeast have definitely found extensive ergs, and many occur in Nefud, but the total area of reg is several times greater.

About half of Arabia is strict desert climatically, and has extremely sparse vegetation. The rest is mainly steppe, most useful toward the western highlands. Only Yemen and Oman highlands have precipitation ample for field agriculture. Their rains are quite reliable because they come in summer with monsoon winds. The seasonal character of precipitation is less pronounced northward, but in the extreme north, as in Mediterranean lands, winter is the season for showers.

The population is predominantly Basic Mediterranean. Bedouin (Badawin) Arabs of most of the peninsula are purely Caucasoid. In the south, however, are conspicuous evidences of the old Negroid peoples, who probably once covered the peninsula; and in Oman occurs a mixed stock with strains that resemble Armenoids. Negro slavery has been a common institution for many centuries. East Indians are present in considerable numbers.

Southwestern Arabs exhibit strains that appear related to the Somali and other peoples of nearby Africa.

With few exceptions speech is Semitic, mainly Arabic and closely related languages. In the south Hamitic and other languages are represented.

Arabia has been dominated by its nomads, as is the case in the Sahara but not in Egypt. Traditional social and political organization has been on a patriarchal and tribal basis. The tribes with most camels and best weapons have had most widespread influence. Nomads still range over most of Arabia, and only slowly are boundaries of territorial states accepted. The majority of the population, however, is actually settled in cities or engaged in sedentary pursuits. The most powerful tribal head today, emperor in the Ethiopian sense, maintains his chief capital somewhat to the southeast of the center of the peninsula, at Riyadh, though Mecca serves as a secondary, alternate capital.

HEJAZ

The culture hearth of modern Arabia lies along the Red Sea coast in Hejaz, a territory of 150,000 square miles and population of 1.5 million. Mecca, birthplace of Mohammed, is a city of some 80,000, largest in Arabia. In its sacred Ka'ba is the black stone supposedly given by Gabriel to Abraham, toward which all Moslems turn and prostrate themselves five times daily. No infidel is permitted to visit Mecca; but 150,000 or more Moslems make it the object of a pilgrimage each year. Medina, 20,000, is somewhat less sacred but contains the tomb of Mohammed. About 200 miles from Mecca, it is the terminus of a railroad from Damascus (Damas), 820 miles to the north. Jidda, chief port on the Red Sea, a city of 30,000, lies 55 miles from Mecca. It is a seat for foreign diplomats who are accredited to Mecca, but who are not permitted to enter the sacred city. Its imports are heavy in comparison with other Arabian ports, because they serve not only much of Arabia but the needs of the pilgrims as well. The chief exports are hides, wool, and gums. The agricultural population of Hejaz raises wheat and barley on the uplands, dates and fruits below, while many non-nomadic herders attend flocks of sheep and herds of horses, donkeys, and camels. Industries are chiefly agricultural and relatively primitive, the making of Arab clocks being among the more complicated.

Asir, 30,000 square miles and population of

750 thousand, is a comparatively unimportant principality to the south of Hejaz, with which it has been united since 1934 under the sovereignty of Ibn Saud, leader of the Wahabis, Sultan of Nejd.

YEMEN

The part of Arabia that actually comes closest to deserving the appellation "felix" is Yemen, 75,000 square miles and 3.5 million population. Here, garden agriculture begins at an elevation of about 4,000 feet. Above Mocha grew a coffee that became world-famous and was taken to the East Indies by the Dutch to become "Java." Brazilian supplies have wrecked the old coffee trade, so that "Mocha" is rarely used in European lands today. Hodeida, 40,000, Red Sea port, suffers from dangerous routes to the interior where coffee, grain, and hides are in surplus. Most Yemen trade now goes southward to British Aden, along safer trails, but some remains with the old and much closer Hodeida. Sana, 20,000, the capital, is a walled city in the interior, at an elevation of 7,500 feet.

ADEN

In Arabia, as in the cases of Gibraltar, Cape of Good Hope, Ceylon, Singapore, Hong-Kong, or the Falkland Islands, the British are established along a strategic "south tip" of land. Aden is a fort, coaling station, and entrepôt. The city, 80,000, is one of the largest in Arabia and carries on considerable trade. With an excellent harbor, it is a port of call for large steamers and a distribution center for many ports along the Arabian and Somali coasts. It exports more coffee than all other Arabian ports combined, and manufactures cigarettes and salt. The climate is extremely hot and disagreeable. Practically all food has to be imported, as do coal and firewood. Annual precipitation amounts to less than two inches and is not reliable. The sea is the only real water supply, domestic and commercial requirements being obtained by distillation.

NEJD

Nejd, 170,000 square miles and 3.0 million population, is centrally located in the peninsula. Its heart is a limestone plateau, cut by wadis along which trails are localized because grazing is richest and water holes most numerous. Extensive steppe spreads between these old stream courses,

where camels find little food in most seasons. Practically uninhabitable desert lies at lower elevations, to the north, east, and south. Non-nomadic herders dwell in better areas. Oases are numerous and produce dates.

Though more or less sedentary groups dwell in such settlements as Anaiza, Buraida, Sudair, Riyadh, and Hauta, and constitute the majority of the population, the nomads are the rulers and dominant people. They are by far the most widespread and aggressive. The Wahabi are especially noteworthy. Followers of the eighteenth century Abdul Wahhab, they are a zealous sect whose strict code has spread among other tribes, such as the Ikhwan. Their present ruler, Ibn Saud, is spokesman for most of Arabia. As King of Saudi Arabia he is supreme over Hejaz and its various dependencies and Asir, as well as Sultan of Nejd, governing a population of 6 million distributed over a considerable area with somewhat uncertain boundaries and extent. Government appears to be fairly well organized over the 350,000 square miles of Hejaz, Asir, and Nejd proper, and extends in more or less nominal fashion to peoples over another area of somewhat more than equal size. The parts of Arabia not included are Yemen, Oman, Bahrein Island, Kuwait, and Aden and the large territory claimed as its protectorate.

From Riyadh, 30,000, a remote oasis, now modernized by radio, automobiles, and other culture traits from the European World, extends a loose governmental control that amounts to little more than an attempt to collect a small annual tax on each camel from nomads of the more distant and inaccessible parts of Arabia. A strong tribe with as many as 2,000 rifles may respect and stand somewhat in awe of the head of the government, but is not likely to pay much tribute, if any. The scattered nomads of interior Arabia, away from the settled oases, still range widely over their territories, hunting for abala wood for the two-poled saddles that fit over the humps of their dromedaries, using milk as their staple diet, and regarding beef and honey as luxuries. Their pillaging and raiding activities are somewhat halted, because they realize that the government has modern tanks, guns, and strength capable of bringing them to submission. Ibn Saud has brought peace to "the sands." His strength lies both in his leading position in the Moslem World and in the income he receives from the Standard Oil Company of California which pays handsomely for a concession on the petroleum of the entire country. Modern, air-conditioned oil towns near the Persian Gulf are European World outposts in an extreme desert.

The once-commercial southern coast of Arabia has for many centuries remained a mysterious land, penetrated by few explorers of European origin. A few decadent ports lie along the Indian Ocean and Gulf of Aden, and hidden cities with many storied buildings lie in interior valleys. The architecture of these buildings is not unlike that of modern American apartment houses superficially. In aggregate they give the impression of concentrated cities with skyscrapers. Farther inland are broad expanses of steppe and erg, ranged over by nomadic tribes. The most extensive sand fields lie in Rub al Khali, and extend well toward the Persian Gulf. In the extreme east, toward the highlands of Oman, is Umm as Samim, comprising vast salt plains with desert quicksands, ready to mire man or beast unfortunate enough to venture upon them. This treacherous area is low. For many thousands of years water has seeped toward it. Salts have been concentrated, and layers close to the surface are saturated and soft. Most of the "empty quarter" is claimed as a protectorate of Aden, giving that part of the British Empire a total area of 115,000 square miles and population (with the city and Hadhramaut) of some 731,000.

OMAN

The coasts of southeastern Arabia are far more diversified in landscape than other parts of the peninsula. Peaks approaching 10,000 feet in elevation commonly bear snow caps in winter. The coconut palm appears toward the shore, but dates grow farther inland. Summer rainfall is ample for raising sugar cane, plantains, indigo, cotton, wheat, millet, and other crops in favored areas. Steppe and desert occur inland, where the finest camels of Arabia are bred and ridden on poleless saddles that are attached behind the hump. This territory, Oman, has an extent of 82,000 square miles and population of 350,000. Its ruler has been subsidized by the British Indian government and assisted by a British advisor.

For centuries the inhabitants of Oman have taken to the sea. Their ancestors likely brought the wares that Himyarites carried to Egyptian Red Sea ports, and probably assisted early Phoenicians in Persian Gulf commerce. Occupying a particularly central and strategic position in the days when maritime activities were restricted to voyages along coasts, Oman was an important link between the peoples of the Mediterranean and those of India and the Far East. Attention later turned to the eastern coast of Africa, where

Arabs encountered Portuguese as political rivals. Here, a boundary established at Cape Delgado in 1650, and still in effect, is the northern limit of Portuguese territory. Arabs of Oman long kept Europeans away from the coast to the north. In 1832 the Sultan of Oman established his court at Zanzibar, which is still governed by a Sultan though administered by a British resident. The African coast was the source of the many slaves brought to Oman, who constitute a considerable population today; Negroids distinct from the old substratum that is so widespread between Africa and the East Indies.

The inhabitants of Oman are quite unlike those of the rest of Arabia. They are very much mixed, but commonly have small bodies, very small, round heads with fuzzy hair, little facial hair, almost black skins, large, dark eyes, but noses and lips that are typically Caucasoid. Many heads are Armenoid, extreme roundness being due to flatness in the rear.

Masqat (Muscat), 4,500, is the capital and commercial center. Trade is almost wholly with India and consists mainly of an export of frankincense and import of rice, cloth, coffee, and spices. A few excellent dates find their way to other markets. The frankincense is gathered by semi-nomadic peoples in the steppe, sap being collected and gum concentrated in a manner similar to that of primitive rubber gathering. It is carried to the coast on camels that normally return with the main product of local fishermen, sardines, to be used chiefly as camel fodder when vegetation is scarcest.

PERSIAN GULF COAST

Bahrein, about half-way up the shore of the Persian Gulf, with an area of 250 square miles and population of 120,000, is an independent Arab state under British protection. Manamah, the capital, is a city of 25,000, busy with activities associated with petroleum exploitation on Bahrein Island. Pearl fishing, the ancient occupation, is decidedly secondary today.

Kuwait, 1,950 square miles and 100,000 population, is another British-controlled sultanate. Al Kuwait, 25,000, the capital, lies close to the mouth of Mesopotamian rivers, in a potentially important position. As rival of Basra, the most important port of Iraq, it has the possibility of becoming the largest city on the Persian Gulf. This depends on completion of a "Berlin to Baghdad" railroad connection that would make Al Kuwait its extreme eastern terminus. At present

it exports wool, hides, pearls, and dates, to near-by countries.

ARABIA DESERTA

Nefud, the Syrian Desert, and the almost uninhabited lands toward the Persian Gulf are in the main too dry and barren for pastoral nomadism. Toward Kuwait is the novelty of a "Neutral Zone" territory, officially recognized as being without government. As a barrier between the civilization of Egypt and that of Mesopotamia, the Arabian Desert long exerted a negative influence culturally. It forced routes around it, through Syria.

JORDAN (TRANSJORDANIA)

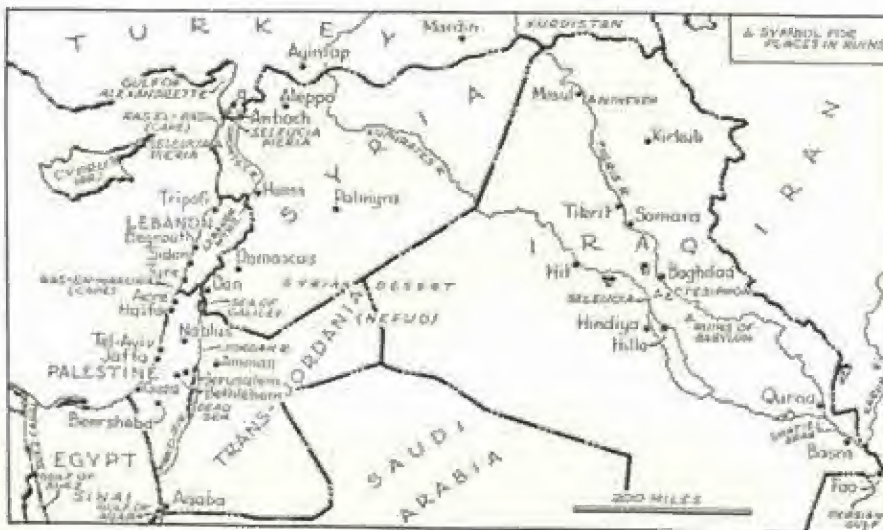
Part of old Arabia Petraea and a rather extensive tract of steppe and desert between the Jordan Valley and Syrian Desert are included in the Arab state of Transjordan, which has been separated officially from Palestine since 1922. With boundaries still undetermined, it has an area of about 37,500 square miles and a population of 1.5 million. Most of the population is nomadic, 93 per cent being Mohammedan Arabs, 6 per cent Christian Arabs, and 1 per cent of mixed stocks, of whom many are residual from invaders who brought languages from the far-away Caucasus region. Amman, the capital, is on the railroad leading from Damascus to Medina and an automobile road from Jerusalem. Most of the population is concentrated along a strip of the country west of the railroad and toward Palestine.

MESOPOTAMIA

The northeastern frontier of the Arab-Berber Realm lies along the foothills of Kurdistan and the ranges of southwestern Persia. The great focal area to the northeast and largest oasis in the entire realm is Mesopotamia, a lowland about as extensive as the lower Mississippi Valley, below Cairo, Illinois, and having about the same population.

A structural depression continues northwestward the trend and width of the Persian Gulf and adjacent lowlands. In Mesopotamia it is land-surfaced, a condition brought about by the alluvial deposition of the Euphrates (south), Tigris, and other rivers east of the Karun. Flood plain extends back from the Gulf to Hit, on the Euphrates, and to Samara, some distance south of Tikrit, on the Tigris. To the west and north are rolling steppe hills.

Most of Mesopotamia has steppe climate, but desert occurs to the south and east. Mosul, well up the Tigris, has an annual precipitation of more than sixteen inches. East of Baghdad the average is under seven inches, but some years are rainless. The season of maximum precipitation is winter, as might be expected in territory so near the Mediterranean. Only rarely is there a drop of rain from the first of June to the end of October. Summers are both dry and hot, the Baghdad average July temperature being above 92° F., which in such dry air means that the thermometer must reach well above 100 on most days, to compensate for the relative cool of early morning. Rather commonly the mercury rises to 120. Winter is cool on the lowlands, where freezes are not uncommon, and cold in the uplands. Janu-



Near East: index map

ary 32° F. is not far away, though Baghdad averages 49 for that month.

The flood season, caused by winter rains and the melting of snow on mountain ranges to the north, reaches Mesopotamia in May and lasts until June, "too late for winter crops and too early for summer crops." Basin irrigation is impracticable here, so crops require a more expensive and in many ways less satisfactory system of perennial irrigation.

CULTURAL BACKGROUND

Legend and some biblical scholars would place the Garden of Eden in Mesopotamia. Ur, about eighty miles south of Baghdad, the birthplace of Abraham, is the most ancient city known, having been in existence prior to 4000 B.C. Here was erected the Tower of Babel—300 feet in diameter, 300 feet tall, with a shrine at its top—and the smaller Ziggurat, about half as high. The pre-Semitic Sumerian empire of lower Mesopotamia was succeeded by the Chaldean empire, with Babylon as its center. To the north, at Nineveh, near modern Mosul, arose the Assyrian empire of upper Mesopotamia. The Assyrians were purely Semitic. The Babylonians were mixed Semites and Sumerians. The peoples of Mesopotamia then, as now, were probably mainly of Atlanto-Mediterranean stock, the ancient group of long-headed Caucasoids from whom the Nordics were probably descended.

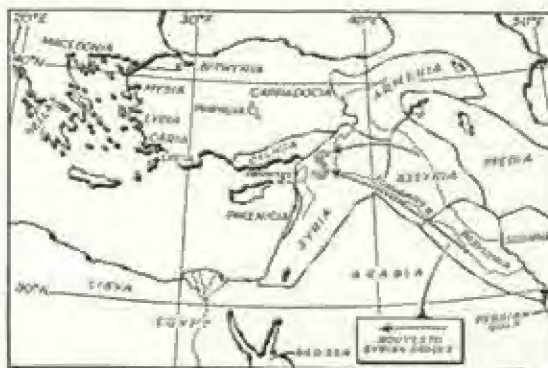
Scholars debate the relative antiquity of civilization in Mesopotamia and Egypt. From one comes evidence of mathematical ability and scholarship known to us rather completely because clay tablets were used for records, whereas the other used papyrus which has not lasted so well. From the other comes a wealth of cultural information, mainly preserved in tombs. One appears to be as ancient as the other, but development was reasonably independent. The barrier of the Syrian Desert, the primitive tribes between, and the aloofness of Egyptians kept them apart. Historically there is a great contrast. The protected Egyptians rarely suffered invasion and ordinarily were the masters of all nomadic neighbors; whereas Mesopotamians experienced many raids and political upheavals and usually were subject to nomadic invaders.

Nefud, the Syrian Desert, and lowland wastes along the Persian Gulf furnished a certain protection to Mesopotamia from the south. The Euphrates formed only a moderately good route into Mesopotamia. Subject to floods and long periods of near-dryness, it could be navigated only downstream and with difficulty. Lands south

of the river became caravan routes in winter and spring, when camels could graze, but were difficult to cross at other seasons. It was from the north that invaders came. The Tigris route from the Syrian Saddle and northeastern part of the Levantine Coast was comparatively easy and much in use, even during most ancient times. Today it is followed by the railroad from Aleppo (Alep, Halep) to Baghdad. Along the entire northern frontier were open valleys from the plateaus of Asia Minor and Persia (Iran).

Southern Mesopotamians dominated the whole territory during the earliest period of history, Sumerians at first, then Babylonians from about 3000 to 1450 B.C. Assyrians, generally astride the route from the Mediterranean and in more direct contact with peoples from the northern plateaus, had to be warlike. The Armenoid Mitanni gained control of northern Mesopotamia in about 1500 B.C., to be expelled by the Assyrians in 1330. Hittites grew powerful to the west and disputed Assyrian territory in the upper Euphrates in about 1300 B.C. Nineveh finally fell to the Medes in 607 B.C. Greeks under Alexander, Romans, Saracens, and finally the Turks, first as comparatively harmless Seljuks and later as destructive Ottomans, were the more recent invaders.

While the civilization in "safe" Egypt reached a comparatively high plane, it eventually stagnated. That in "dangerous" Mesopotamia took quite a different course, developing military forces, such as were unknown in Egypt, and profiting from commercial and cultural contacts with outsiders. In general, Mesopotamia progressed until the time of the Ottoman Turks, when it suffered destruction severe enough to practically wipe out its old culture. Two periods were especially bright. The Pax Romana, 31 B.C. to A.D. 378, was a time when water supply systems were developed



Near East in Antiquity

and general prosperity arose. The second bright period followed the Saracen conquest in 638.

After a long period of decline from about A.D. 1100, Mesopotamia is now showing some sign of revival. The decline has been absolute, with some 4.8 million people now living where 10 million have lived, in squalor where luxury once abounded. It is a land of rivers that are not sufficiently controlled. About one seventh of potentially productive acreage is actually being used. Malaria rages in undrained areas. Italians have been covetous, knowing that Mesopotamia has the possibility of supporting a population of 30 million according to European standards. The Germans have been deeply interested in its commercial potentialities, as gateway to the East, over the Berlin to Baghdad Railroad, a project completed in 1940, after about eighty years of labor. The French have regarded it as a natural eastward extension of their possessions on the northern Levantine Coast. After World War I, however, it was the British who obtained political control and petroleum concessions in what turned out to be one of the richest oil reserves on earth. The Soviet Union is deeply interested in this petroleum at present.

IRAQ

After governing most of Mesopotamia by mandate of the League of Nations since 1920, the British established Iraq as an Arab Kingdom, under their protection, in 1927. Its area is roughly 116,600 square miles. The population is estimated as between 4 and 5.1 million, some 100 thousand of which are Jews and 90 thousand Christians; otherwise it is solidly Arab and Mohammedan. About 90 per cent live in cities or on cultivated land. Population density is greatest along the banks of Shatt el Arab, the 100-mile lower course of the combined Tigris and Euphrates.

Petroleum production ranks first among commercial activities, the finest oil fields lying close to the Persian border, especially in the north toward Mosul. Dates rank second. About 80 per cent of the world's export comes from some 30 million trees along Shatt el Arab, said to be one third of all date palms in existence. The trees are irrigated by water backed up with the rise of tide in the Persian Gulf. From Fao on the coast to Qurna (Korna) on the Tigris, extends an almost-continuous grove of palms. The raising of sugar cane and opium poppies in the south, rice and fruit along the rivers, cotton, wheat, barley, sesame, millet, and maize farther up-

stream, and sheep and wool in the north, occupies most of the population. Barley is particularly favored as a winter crop by a short growth season. It is supplemented by wheat and millet. Rice and maize are raised as summer crops. The cultivation of cotton was introduced on a large scale by German interests. Tobacco grows along the borders of the Kurdish hills. Cattle are raised by peoples along the rivers; camels by the nomads to the west and south. Both the Hilla and Hindiya branches of the Euphrates, just below Babylon, cross an extremely fertile region. A dam at Hindiya helps irrigate rice, barley, wheat, and dates.

Baghdad, 500,000, capital, is the largest of all Arab cities. It is the modern equivalent of Babylon, Ctesiphon, and Seleucia, all of which were located in the region where the two great rivers come close together, in central Mesopotamia. The modern city lies on the navigable Tigris, about 500 miles from the Persian Gulf, and is served by river steamers from Basra. The interests are political and commercial, most trade being with Persia (Iran).

Basra, Iraq's second city, is the seaport, served by such ocean-going steamers as are able to enter and use Shatt el Arab. It exports dates, opium, wool, barley, petroleum, and other commodities.

Mosul, where the Tigris emerges from the hills of Kurdistan, is a trade center close to old Nineveh. The surrounding region is pastoral. Petroleum at Kirkuk and other places has brought new commercial activities since 1927.

The Tigris is navigable as far as Mosul, though traffic may have difficulties above Baghdad during the low-water season, from April to September. The Euphrates is less useful as an artery of traffic. Steamers reach Hindiya, but most of the boats are very small, and flat-bottomed. Above Hindiya almost all transport is downstream and during low-water involves the use of rafts made of inflated skins, or other crude types of craft.

SYRIA

The old Turkish province of Syria was about equivalent to the Levantine part of the Arab-Berber Realm. Today this territory includes Palestine, Lebanon, Latakia, and modern Syria. The former extends north from the Egyptian boundary along the coast to Ras en-Nakura, not far south of Tyre (Tyr, Sour, Sur), and inland to ancient Dan in the Jordan Valley. To the north is coastal Lebanon (to beyond Tripoli) and Latakia (to Ras el-Basit). Modern Syria includes the northernmost coast of the Levant, almost to the head of the Gulf of Alexandrette, and a broad

interior region; the Syrian Saddle; some of upper Mesopotamia; and the hinterland of Damascus (Damas).

Palestine has an area of 7,800 square miles and population of 2.0 million. Syria, with the associated governments of Latakia (2.8 thousand square miles, 0.4 million population) and Jebel Druse (2.4 and 0.1), contains 66,000 square miles and 3.7 million people. Lebanon has an area of 4.0 thousand square miles and population of 1.285 million. The whole region is thus an area of 77,800 square miles and has a population of 7.0 million.

PHYSICAL BACKGROUND

Mountains and plateaus lie close to the Levantine coast. The plain along the Mediterranean is broken and narrows toward the north. Old Phoenicia was the strip just west of the mountains of Lebanon and was sheltered by them. In Palestine there is a southward widening of maritime flats across the plain of Sharon, to Jaffa, which continues in the plain of Philistia. Rainfall decreases southward. Beyrouth (Beirut) has an annual precipitation of 36 inches; Gaza has but 16 inches. Where the plain is broadest it has least agricultural value, because of aridity.

Highlands extend more or less continuously from the eastern side of the Gulf of Alexandrette to Sinai. Were it not for the presence of a deep graben, not many miles behind and parallel to the coast, these highlands would be the Levantine face of a tilted plateau, much like Arabia, sloping gently toward Mesopotamia, as Arabia slopes toward the Persian Gulf. The Jordan Valley graben more or less isolates the coastal highlands as a belt of residual mountains. These are highest in Lebanon, where some peaks rise to about 11,000 feet.

The mountain belt is cut through by El Kebir River, not far north of Tripoli. This stream winds around the northern end of the Lebanon Range from headwaters west of Lake Homs, providing an easy route between Tripoli and Homs. North of Latakia the Orontes Valley (Nahr el-Asi) winds back from the coast near Seleucia Pieria (ruins), past Antioch, to branches extending north toward Ayintap, east toward Aleppo (Alep, Haleb), and south, past Homs. For most of its length the Orontes runs rather parallel to the coast, through a region known as Chab, in the graben to the rear of the coastal mountain belt. The Orontes Gap was one of the important ancient routes across the Syrian Saddle to Mesopotamia.

The mountains of Lebanon project high enough to receive from 40- to 50-inch rainfall. Since the

season of maximum precipitation is also the coldest, they accumulate considerable amounts of snow. Their forests were among the most important ancient natural resources of the eastern Mediterranean region, exploited under treaty provisions between the Phoenicians and other peoples. Today few of the cedars and other trees are left.

South of the mountains of Lebanon, the mountain belt is cut by the Litani River which reaches the coast just north of Tyre. The valley heads north, along the El-Beka portion of the graben. To the east is the Anti-Lebanon, across which lies Damascus. The main routes to Damascus from the coast lie on either side of the Litani Gap, across gaps in the Lebanon Range behind Beyrouth, or over lower passes from Haifa, to the south.

The hills of Galilee lie south of Litani Gap and are separated from the plateau of Samaria by the Esdraelon Plain, a fertile, wheat-raising region extending inland from Haifa. This plain provides an easy passage to the graben, Damascus, Amman, and all other interior points. Mt. Tabor rises on the right of the Esdraelon Corridor and



Palestine: relief

Mt. Carmel on the left and farther toward the coast. Neither of these famous peaks attains 2,000 feet. Samaria is lower than Galilee. Both experience snowfall quite regularly, and naturally are covered by scattering trees. The plateau of Judea to the south is drier, more rugged, and comparatively barren. Jerusalem, at 2,600 feet, receives about twenty-six inches of precipitation, some of which is snow. The upland belt, rarely more than forty miles wide in the north, broadens southward and becomes increasingly arid. Beersheba (Bir es Saba), the traditional frontier of ancient Judea, is close to the boundary of the desert. Ancient Israel centered to the north, in fertile Samaria, while Judah embraced the more arid southern parts of the plateau. As a Roman province it became Judea.

The graben belt, into which the Orontes, Litani, and other rivers turn, is most sharply differentiated southward, along El-Ghor, the Jordan Valley, and Wadi el Jeib (Wadi el-Araba), as well as the Gulf of Aqaba, east of Sinai. The lowest lands on earth, 1,292 feet below sea level, around the shores of the eight by forty-six mile Dead Sea, stand over 1,300 feet higher than the bottom of that saline waterbody. Salts of various kinds have been concentrated in the Dead Sea for many thousands of years. Bromine, potash, and other chemicals are recovered from its waters by evaporation. The extremely arid southern part of the graben, with unbearably hot summer temperatures, is an excellent boundary between two political units, Palestine and Transjordan.

Neither graben nor highlands to its east are very distinctive in northern Syria. The Syrian Saddle offers several routes to Mesopotamia, localized by passages through the coastal highlands. Farther south where the graben belt is lower, the western margin of the plateau leading to the Syrian Desert is correspondingly more abrupt and harder to climb. The railroad south from the Baghdad line, through Aleppo, crosses the plateau southward past Hama and Homs, enters the upper Litani Valley, and climbs to Damascus between the Anti-Lebanon and 9,700-foot Mt. Hermon. The line south to Medina remains on the plateau through Transjordan. Damascus has a 12-inch annual precipitation. Most of the upper part of the plateau is steppe, but this comparatively narrow grassland belt merges into desert eastward, at lower elevations, toward the Syrian Desert. The steppe-desert boundary is extremely sensitive to small climatic changes. Historic time has witnessed some shifting of population for that reason.

CULTURE BACKGROUND

The coastal lowland corridor, attractive agriculturally, strategic from the commercial standpoint, and the connecting link between Egypt and Mesopotamia, has been used by various peoples since prehistoric time. Egyptians were generally its rulers until about the first century B.C. and for short periods since, particularly for about two centuries after A.D. 1268. The maritime culture of the Phoenicians probably originated around the head of the Persian Gulf, prior to 3000 B.C., and subsequently came to the Mediterranean coast. In Sidon, Tyre, and other cities protected by narrowness of the corridor and ruggedness of the Lebanon Range, these early seafarers founded cities, mainly on defensible islands, where they could carry on commercial enterprises in relative peace. At various times, between 3000 and 600 B.C., they attempted to push eastward, across the Syrian Saddle, more to control trade than with any idea of territorial conquest, but without great success. The Assyrians, who were in control of the Saddle during most of the interval, 1270-720 B.C., had similar designs and pushed westward toward the Mediterranean. Hittites disputed trade rights at times, meeting Egyptians at Homs in about 1400 B.C., and being successful mainly between 1375 and 1200 B.C., wresting control from the Pharaohs, who had held that city since 1500. Egyptians regained dominance after 1200 B.C. These, and other rivalries, generally kept the Phoenicians on the coast. To the south of them came and settled a very advanced and cultured people, the Philistines, who were possibly displaced Minoans, from Crete. Jaffa (Joppa) became their commercial center.

The interior was a land of tribal nomads. Important lines of communication were kept open between the Levant and Mesopotamia. Palmyra, which apparently became most prosperous in the third and second centuries B.C. and numerous other outposts in the Syrian Desert were located along heavily used caravan routes. During the winter, when camels could graze in desert territory, southern and more direct routes could be used, but in the heat and aridity of summer, commerce was restricted to northern trails from the Syrian Saddle through steppes leading toward Mesopotamia.

The ancient Levantine trade involved such articles as pearls, spices, and jewels from India; gems and embroideries from Babylon; sheep, goats, and wine from northern Mesopotamia; horses, cattle, and metals from Armenia; and gums, perfumes, ivory, and cloth from Egypt. The Phoenician cities supplied manufactured wares. From the Mediter-

anean shores traders brought olive oil, wine, copper, and purple dye. In Lebanon and on Cyprus they had sources of timber. From the gates of the Black Sea they returned with tunny fish.

Roman conquest of the Levant culminated between A.D. 115 and 363, and resulted in control of the Saddle and places as far east as Nisiblis, which was close to modern Mardin. Peace, prosperity, and material gains, such as aqueducts, better buildings, and roads marked the Roman period. With decline of Roman power, the Syrian Saddle came under the rule of Antioch. A period of commercial and cultural decline ended in 638, when the Saracens gained control. Trade again flourished, Far Eastern goods were moving in quantity from the Persian Gulf, through Mesopotamia, and across the Saddle to the Mediterranean. The Crusaders, who reached the Levantine Coast at various times after 1098, were quite as much interested in this thriving trade as in suppression of Mohammedanism. Antioch was captured and firmly held until 1268. The Phoenician coast was occupied solidly as far south as Beyrouth. Comparatively little interest was taken in the inland, noncommercial throne of Jerusalem, which was held rather weakly as a Latin kingdom. In 1268 Egyptians took control of the Saddle and held it for over two centuries, keeping in check the Ottoman Turks of Anatolia who finally overpowered them and brought a period of blight to all of Syria, Mesopotamia, and most Saracen lands. When Italian city states turned their energies toward development of Far Eastern trade via the Red Sea and Alexandria, the usefulness of the Syrian Saddle declined. With the Voyages of Discovery came a fatal blow to all eastern Mediterranean trade with India and China—the finding of sea routes through the Atlantic.

The differences among invaders of Syria have been cultural and political, rather than racial. Most invaders were peoples of Mediterranean stock, the main exception being the appearance of considerable numbers of Armenoids. An extremely small amount of non-Caucasoid blood ever reached the area. For many centuries the language has been Semitic. Though Christian minorities occur in places, most of Syria is solidly Mohammedan in religion and Arabic in culture. The Syrian is an Arab who is settled on a farm or in a city. He may be strongly Armenoid, but is typically a Mediterranean.

New minorities have recently appeared in Palestine, where the population increased nearly a million between 1922 and 1943. Of this increase 440 thousand were Arabs, 419 thousand Jews, and 60 thousand were Christians. Of the Jews,

80 per cent were immigrants. In 1948 the Republic of Israel was created. It is estimated that a million Arabs have left the country, so that by 1953 of a population of two million only 170,000 were Arabs.

The Jews are by no means a group of Mediterraneans whose ancestry traces back to Palestine. They have come from Europe and are a composite racial mixture, with Alpine and Nordic, as well as Mediterranean strains. Their uniting bond is religion. Spanish is the native tongue of many; Yiddish, a dialect of High German, written in Hebrew characters, is the language of most. Their cultural backgrounds are extremely varied, but most who have gone to Palestine have in common a tradition of persecution in other lands that has taken the form of pogroms and expulsions in many cases.

Jewish emigration to Palestine has resulted from British policy, as set forth in the irreconcilable Balfour declaration of 1917, to establish Palestine as a national home for Jews and at the same time having it "clearly understood that nothing shall be done which may prejudice the civil and religious rights of the existing non-Jewish communities in Palestine."

CULTURAL LANDSCAPES

Relics from Antiquity occur in the form of ruins of cities, individual buildings, fragments of Roman aqueducts, erosional consequences of deforestation, and the like. Long in the hands of Arabs, Syria has become a typical Moslem land in which slender minarets dominate the skylines of cities and towns. The dry interior is a region of nomads, water-holes, and trails; it is typically part of the Dry World. Population is concentrated in oases, in Dry World fashion, but is also spread out in rural form over areas of fair size, here and there, toward the Mediterranean coast, in European World fashion. The coastal cities are white masses of angular buildings, commonly surrounded by the bright greenness of citrus trees, framed by rather barren highlands above the deep blue of the sea, which in distant views differ little from cities of Greece, Sicily, or Barbary. The coastal population is culturally Mediterranean, as are the cultural landscapes. Syria is a transitional zone between culture worlds.

Most of the population is agricultural, as in the Mediterranean Realm of the European World. The crops are wheat, as leading cereal, barley (more important in the interior, where the growing season is short), maize, millet, cotton, sesame,

melons, figs, citrus fruits, tobacco, olives, and grapes. Cotton is grown mainly to the north of Saida (Sidon), along the coast of Lebanon and northward. Mulberries are decreasing in importance, because Far Eastern competition makes silk production less and less profitable. Olives thrive widely, the finest crops being obtained from the vicinities of Jaffa, Nablus, and Acre, in Palestine; and in hills back of the old Phoenician coast to the north. This is also the main region for producing wine and citrus fruits. The tobacco district lies farther north, in Latakia and Syria.

The areas of Jewish immigration are particularly productive. The plains of Sharon and Esdraelon have witnessed the development of important collective farms of modern design. Citrus fruits are the main cash crop, usually offering the best return per acre. Wheat, barley, millet, olives, grapes, melons, tomatoes, and other crops, even including a few bananas, broaden the agricultural base and lessen the impact of failure of any particular product. In spite of this highly developed agriculture, Palestine fails to feed itself and has to import food.

The main industrial developments of Syria are associated closely with agriculture. Little manufacturing is more complicated than weaving textiles, tanning hides, making wine, or processing tobacco.

Seaports north of Tripoli are comparatively unimportant, but serve local hinterlands. Tripoli is connected by railroad with Homs and since 1935 by pipeline with the oil fields east of Mosul. It is now an important export center for petroleum, and manufactures olive oil and soap. Beyrouth is connected by rail with Damascus and serves as its chief Mediterranean port. It is the capital of Lebanon and leading port of Syria, an important outlet for citrus fruits, olive oil, soap, tobacco, hides, and other products. Saida exports lemons and is terminus of a petroleum pipeline from Saudi Arabia. Acre, with one of the best harbors along the Levantine Coast, was the main port for the Crusades, the place where Medieval Europeans came into contact with arts and sciences their ancestors had forgotten. Here they encountered new foods and luxuries, developing tastes that stimulated trade which finally resulted in the Voyages of Discovery and the Commercial Revolution. Haifa, on the plain of Acre, is terminus of a second pipeline from Mosul and an exporter and refiner of petroleum. It also has railroad connections with Damascus, which it serves as a secondary port. As outlet for the plain of Es-

draelon, it is making rapid progress commercially. Jaffa, port for the plain of Sharon and terminus of the railroad from Jerusalem, exports oranges, olive products, wine, and many other items. It serves an important tourist trade with Holy Land objectives. Nearby Tel-Aviv, which can accommodate small steamships, is a modern city, created by the recent colony of Jews. With a population well in excess of 400,000, it is the largest city along the coast and larger than Jerusalem. Gaza, southernmost port in Palestine, has an excellent harbor, but comparatively little development because its hinterland is dry and unproductive.

An interior belt of cities extends south from Aleppo along the railroad to Arabia, but Jerusalem lies to the side, across the deep Jordan Valley. Aleppo is an important railroad junction, with lines extending across Anatolia to Europe, through the Syrian Saddle to Baghdad and Basra, and southward, through Damascus, either to the coast, or through Amman to Medina. It has considerable textile industry, mainly concerned with weaving and dyeing of silks and cottons. Homs is a local trade town that has also developed textile industries. Damascus, capital of Syria, is an oasis site with textile mills, tanneries, cigarette factories, flour mills, and other industries. As a cross-roads point, it is not only an important railroad junction, but also the terminus of a motor highway to Baghdad through the northern side of the Syrian Desert. Jerusalem is a Holy City to peoples of three flourishing and large religions, Jews, Christians, and Mohammedans. Founded in the eighth century B.C., it went into Moslem hands, to be more or less wrested from them by the Crusaders from A.D. 1099 to 1244. Between 1244 and 1917 it was in the possession of Moslems, including Turks since 1517. The British occupied the Holy City in 1917 and have administered it ever since. Jerusalem is visited annually by a tremendous number of pilgrims from the Orthodox Catholic Church. It also attracts a huge tourist trade. The great Mosque of Omar occupies the site of King Solomon's Temple and contains the sacrificial stone of Abraham. Bethlehem, not far to the south, is the site of the Church of the Nativity, said to be the oldest Christian Church in the world. The population of Jerusalem is 127,000. It has comparatively little industry, other than that demanded by a city of its size.

As a result of World War I, Turkish Syria was divided into the French Mandate territory of Syria and Lebanon and the British Mandate of Palestine. In 1944, after a series of political up-

heavals, the French ceded control to native governments. The British have hung on longer, but under very difficult conditions arising from the impossibility of fostering a Jewish national home in Arab territory without arousing deepest resentment of the people who have held it since the thirteenth century. Successful in a short war against Arabs and Egyptians, the Jews at long

last established, in 1949, their own government of Israel. This new state has tremendous commercial potentialities. It will establish a stronghold of European World culture in territory long in the Arab-Berber Realm. Its cultural landscapes are becoming increasingly Mediterranean.

32: Southwestern Plateaus

Semitic lands extend northward almost to the isotherm of January 32° F. in the uplands beyond Mesopotamia. Though Saracen conquests extended into Persia, Arab control was readily relaxed in highlands, where date-palm oases dropped out of landscapes and flocks required protection from winter cold. Ways of life familiar in the south had to be modified if Arabs were to live in Anatolia or the Iranian Plateau. Arabs were content with the conversion of peoples to Mohammedanism and did not choose to remain as settlers. Later on, various Turks appeared from the northeast and conquered lands as far south as southern Arabia. Turkish peoples generally remained in the north and governed their southern and western possessions from afar. Political and religious history has not greatly modified the culture break north of Syria and Mesopotamia.

Many Asiatic deserts are as arid as the Libyan erg: too dry for pastoral nomadism. They are flanked by extensive areas of reg, which are surrounded by steppes where grazing is relatively good, where pastoral nomads range, and still better regions, where herders live more settled lives. Oases support sedentary agricultural populations, which are largest and densest where water supplies are best. The major patterns of Dry World life extend from the Atlantic to Mongolia, across the high plateaus of central Asia.

Culture traits and ways of life are unified in many ways in the Dry World. They differ profoundly from those in desert and steppe areas of the Americas, southern Africa, or Australia. It is not climate alone, nor physical facts, that account for the contrast. Patterns of life originate with peoples and survive or are exemplified according to fitness or adaptability to environmental conditions. The contrasts between realms of the Dry World hinge on far more than environmental changes north or south of the isotherm of January 32° F. Cultural heritages of the Turks and Mongoloid peoples to the north are only in part similar to those of the Arabs and Berbers to the south. It is appropriate that the Dry World culture realms be designated in terms of dominant inhabitants.

The Turko-Mongolian Realm extends from the

heart of Anatolia across the Iranian Plateau to the borders of India. It crosses the Trans-Caspian Depression and highlands of central Asia as far as eastern Mongolia. Turko-Mongolian lands border two realms of the European World (Mediterranean and Eastern) along western and northern sides, the other realm of the Dry World to the southwest, and the Oriental World to the southeast. Politically they are fringed by the Soviet Union along their entire northern border.

ANATOLIA

Asia Minor juts westward between the Black and Mediterranean seas. Most of it is a plateau, generally about 3,000 feet high in the peninsula and rising eastward to over 5,000 feet, toward the mountains of Kurdistan and Armenia. Coastal lowlands are narrow both to the north and south. Behind them rise steep slopes to summits higher than most of the interior plateau. The whole peninsula is part of the east-west Eurasian mountain barrier and its individual ranges continue eastward the trends of such European structures as the Rhodope Mountains and the Balkans. The Pontic Mountains along the Black Sea are continued westward across Bithynia to the Bosphorus. The Taurus range along the Mediterranean lead to highlands in Rhodes, Crete, and northward into the Pindus Mountains. Western Anatolia is something like a hand with slightly-spreading fingers pointing toward the Aegean. The rivers Meander (Menderes), which flows past Aidin (Aydin), Gediz flowing past Manisa, and Sakarya east of Bursa, and the Sea of Marmara are associated with lowlands that run eastward from the Aegean between fingers of the Anatolian hand. The most useful lowlands lie in the west, readily accessible from islands in the Aegean or from the mainland of European Turkey.

Many Anatolian mountains are growing actively today, as is demonstrated by the frequency and severity of earthquakes. In the east are more or less dormant volcanoes, including the great 16,916-foot Mt. Ararat, on the Armenian frontier.

From the climatic standpoint, Anatolia is hardly a typical part of the Dry World. Much of the in-

terior is arid and some is desert, with less than 10-inch annual precipitation; but about one third of the entire peninsula is more or less suited to agriculture, and about one eighth is in forest today. Annual precipitation in excess of twenty inches is general around coasts and seaward slopes, with twice that much along parts of the eastern Black Sea coast. Extreme values reach the order of 100 inches. Comparatively little of Anatolia drains into interior closed basins. These parts, with typical Dry World drainage patterns, lie in the west-central part of the peninsula, north of the Taurus ranges. Many short streams lead south to the Mediterranean and west to the Aegean. About half of the peninsula drains into the Black Sea, chiefly along the Sakarya, Ulutachai (Filigas), Kizil Irmak, Kelkid Irmak, and Coruh. A large part of southeastern Turkey drains into the Persian Gulf, through the Euphrates and Tigris. A small area near Armenia drains into the Caspian.

The climate along the coastal belts is Mediterranean, with mild winters (Smyrna (Izmir) 46° F. in January, 80° in July) and cool-season precipitation. The olive belt, however, is not over twenty miles wide at many places. Winter rains are effective for growing cereal crops, even though the annual precipitation may be low. Summer dryness provides a dependable harvest season and an opportunity for drying fruit. The lowlands of the southwest, particularly around Smyrna and Aidin, present landscapes that are essentially Mediter-

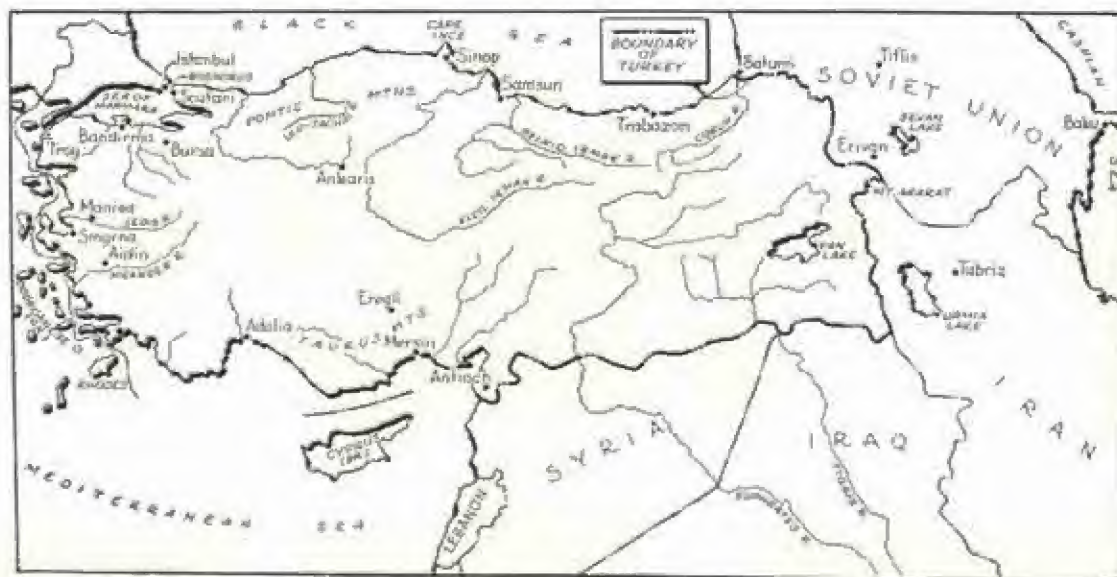
anean in character. The transition to the Dry World lies behind and above, beyond a zone of maquis.

Interior Anatolia has rather severe winters, with January averaging below freezing at most places. Most of it is cold-winter steppe, with appropriate Dry World landscapes. Higher parts are above the timber line which averages about 6,000 feet along the Black Sea coast and 8,500 along the Mediterranean. Icy, dry winds sweep across the interior in winter, mainly from the northeast. In summer the temperature rises to high levels and drought is intense.

CULTURE BACKGROUND

Anatolia has always served as a connecting link between most of Asia and southeastern Europe. Peoples from the dry interior commonly migrated along the steppe route across southern Russia, but at times they climbed the Iranian Plateau and crossed Asia Minor. Those from the southeast found paths converging across Anatolia to the sides of the Sea of Marmara. The traditional route to the west, for both invaders and commerce, crossed Asia Minor about along the parallel of 40° N. through Ankara (Angora).

When, in about 2200 B.C., the Hittite Empire controlled all of Anatolia, its capital was at Ankara. The people were Armenoid when written history began, and that racial stock is still prominent. Dinarics and Mediterraneans often invaded Anatolia from the west. In 1200 B.C., Phrygians from Thrace, who were probably Dinaric, blotted



Anatolia; index map

out the Hittite Empire. Troy, on the Asiatic side of the Dardanelles, was an important city founded prior to 1500 B.C. Like other parts of Asia Minor, it was invaded by Nordics and Mediterraneans from the west. The domain of Persia was spread westward across Anatolia when Greek power began to wax across the Aegean. Greeks contested coastal lands with success and occupied them. At times their ambitions extended farther inland and population stocks were mixed accordingly.

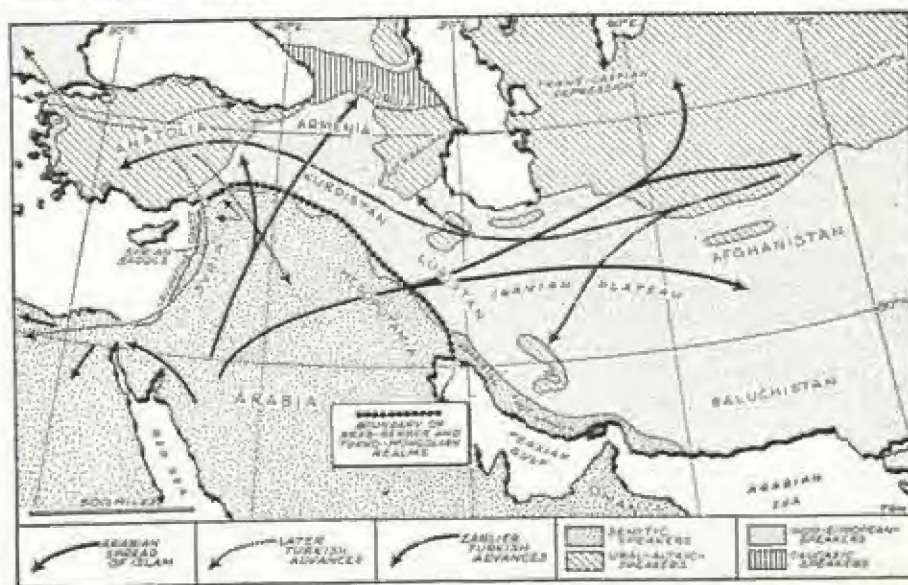
In the third century B.C., Anatolia was one of the most advanced participants in western civilization. Some 500 industrial settlements were busy making cloth, carpets, pottery, wines, and wares of bronze, gold, silver, and iron. Its marbles vied with those of Greece. Coastal districts prospered during Roman times. General decline occurred during the Byzantine period. Many of the inhabitants were converted to Christianity.

The Turks are comparative newcomers. Various Turkish tribes began filtering into Asia Minor in the eleventh century, A.D. These Dry World inhabitants from east of the Caspian were Mongoloid, and used Ural-Altaic languages quite unlike the basic Indo-European tongues of the peninsula. The inflow reached a peak about the time when the great Mongol Empire of central Asia began breaking up and the Ottoman Turks appeared. These horsemen, like Avars, Huns, or Tatars, came in waves with interests centered in plunder and conquest. Anatolia, a territory of their liking, was made a base for acquisition of an extensive empire. By 1453 they had captured Constantinople. In 1566 Turkish domain extended to southern Arabia, Egypt, Hungary, and the Sea of Azov. In 1683 Turks were at the outskirts of

Vienna, where they were repulsed in a battle that was quite largely responsible for most Europeans being Christian today, rather than Mohammedans. Though pagan at first, the Turks adopted Mohammedanism while conquering Saracen lands, and soon became the chief zealots of that faith. With the general enthusiasm of a newly converted people they spread the Crescent across the Balkans and persecuted infidels with greater thoroughness than the Saracens in their crossing from Africa to Iberia.

During the last two and one-half centuries the Turkish Empire has declined and shrunk, the last serious territorial losses occurring during World War I, when Turkey was reduced from 710,000 to 300,000 square miles and its population from 21.3 million to about half that amount. Armenia, Syria, Mesopotamia, part of Arabia, and Palestine were taken from the empire. In 1911-1912 the Italians acquired the Libyan desert and its coast.

At the end of World War I Turkey became a republic. The capital was withdrawn to central, Asiatic Ankara, away from European Istanbul. Somewhat paradoxically, retreat to Asia was to be soon followed by considerable Europeanization. The severe restrictions of Mohammedan faith were abolished, rights of non-Turkish population recognized, slavery and polygamy went overboard, the Gregorian calendar and 24-hour clock were adopted, as was the metric system. Schools were established. Compulsory, free education is now provided for everyone between the ages of seven and sixteen.



Islamic and Turkic advances

The expulsion of Greeks from the west coast settled a serious minority problem, but at considerable loss to industry and progress. Many of them were actually Greeks, but others were descendants of various Anatolian Christians who had refused conversion to Islam. In aggregate they were the nation's most prosperous and progressive population. Even without them, however, Turkey is making rapid strides forward and, instead of continuing as the "sick man of Europe," is being revitalized as a nation of considerable importance.

Little Mongoloid blood remains in Anatolia. Turks have intermixed with the Armenoid and Dinaric stocks to such an extent that Mongoloid traits have practically disappeared, as they have in Hungary. Turkey is almost purely a Caucasoid land today. Osmanli, or Turkish language, however, is almost universal. In some sections the dominant tongue is some other Turkish-Tataric language, such as Kizilbashian or Tahtajic. Hellenic Greek survives on some coastal plains. Indo-European Armenian is widespread in the east.

MODERN TURKEY

The Republic of Turkey now has a population of nearly 21 million. The density averages about sixty-five per square mile; somewhat more than that of the United States. It is greater in the northwestern half of Asia Minor, where it lacks concentration in oases and other Dry World distributional characteristics.

Agriculture occupies somewhat under 10 per cent of the land but accounts for 70 per cent of the national income. Wheat is the most widely-grown cereal crop. Barley ranks second, a considerable amount of which is exported to Great Britain, where it enjoys an excellent reputation for malting. Tobacco, the chief cash crop and leading export item, is grown around all coasts. Along the Black Sea the main productive area is east of Cape Ince. Sinop and Samsun are tobacco export ports. Hazel nuts (filberts), the second export item, grow along the Black Sea coast and in such quantity that Turkey is the world's most important source. Most of them go to Europe, chiefly to places manufacturing chocolate bars.

The more typically Mediterranean crops grow along the west and south coasts, particularly in the lowlands near Smyrna and Aidin. Seedless sultana grapes, Turkey's third main export item, are dried and exported as raisins, or pressed to make a delicate dry wine. Turkey leads all other nations in export of dried figs. There is a surplus of wheat for export, also of cotton. Attar of roses,

sesame, silk, olives, maize, and opium are other important products. Smyrna (Izmir), the principal port, has good railroad connections to the interior and Aidin. In addition to agricultural exports, it serves as an important entrepôt for other places along the coast and Aegean islands. In addition to figs and raisins, it ships out products from the central plateau. The local valonia oak has acorns rich in tannic acid, which supply the tanneries of Smyrna. Other industries include making soap, from olive oil and other fats, and cigarettes. Adalia (Antalya), on the mid-south coast, is an active port and flour-milling center. Mersin to the east is an outlet for cotton, opium, and products of the Cilician Plain. It has rail connections to Adana which is on the Baghdad Railroad.

The interior is more typically part of the Dry World. Extensive areas are grazed by nomads, with herds of sheep and goats. The Angora goat has long silky hair which is known as genuine mohair, the material used in the finest rugs and fabrics. Eastward the nomads are horsemen. Yoghurt, the staple diet, is made from soured milk of sheep, camels, goats, or other large herbivores. Tents are common habitations in the warm season. In winter both nomad and sedentary folk retire to squalid villages of mud huts where they carry on such home industries as weaving and rug making. The sharply seasonal climate favors transhumance, which is far more characteristic of the Turko-Mongolian than of the Arab-Berber realm.

Ankara (Angora), in the central interior, is a comparatively modern capital. Eregli serves it as a Black Sea outlet. Bandirma (Panderma), on the Sea of Marmara, is an important export center for the interior. Mohair and hides are leading exports.

Istanbul, one million, Europe's gate to Asia Minor by way of Scutari (Uskudar), is a cosmopolitan city of declining importance, a monument to a long and glorious past. It carries on considerable entrepôt trade with Black Sea ports.

Turkey has rich mineral resources and could become an important industrial country. Coal supplies are not particularly good, but some exist near Aidin and more near Eregli. Turkey enjoys almost a monopoly on meerschaum and emery, ranks second in the production of chromium, and mines a considerable amount of lead. It also has deposits of molybdenum, zinc, manganese, copper, antimony, gold, and silver. Of non-metallic minerals, are various salts, including borax, and the hydrocarbons, asphalt and petroleum, the latter occurring near the Sea of Marmara.

The continuation of recent trends will remove most of Turkey from being transitional territory between culture worlds. Like coastal Barbary, it is

rapidly becoming part of the European World. Much of the interior, however, like the southern parts of Atlas Lands, is wholly unsuited to development of European ways of life and will remain typical Dry World territory.

ARMENIA

Most of the region between Syria and the Black and Caspian seas is included politically within Turkey, but actually is dominated by peoples who speak Armenian, Iranic, and Tataric languages. It is chiefly high, rugged territory, where life is tribal and nomadic. The governmental grip of both Turkey and Iran is weak. The influence of Soviet power and culture is making considerable headway southward. Georgian, Armenian, and Azerbaijanian republics, all organized after World War I, are now parts of the Soviet Union.

Greek- and Armenian-speaking peoples along the Black Sea coast, east of Cape Ince, are commercially tied to Batumi, the main seaport of western Georgia. Tea and tobacco from this region are becoming significant in Soviet economy. Batumi is the western end of a pipeline leading from the oil fields of Baku. Eastward, across Georgia, is Caucasian- and Tataric-speaking territory in part dominated by European World influences. Toward the Caspian is Azerbaijan (Azerbaidzhan), which is predominantly part of the Dry World, but which contains as capital, Baku, industrial and petroleum-refining, a modern city of 0.809 million, fifth in the Soviet Union.

Lowland populations of Azerbaijan and Armenia engage in agriculture wherever sufficient water exists, raising cereals, cotton, grapes, and various fruits. The uplands are volcanic and barren. Here, life is nomadic, except in the vicinities of various mining or localized industrial districts. Soviet Armenia produces large quantities of wine, champagne, and cognac. Hydroelectric resources have been developed along the outlet stream from Lake Sevan (Gokcha). Plants for making synthetic rubber, cement, and other products rise here and there amid rather barren surroundings. Eriuan is a modern city of nearly 200,000, an educational and industrial center connected by rail with Tiflis (Tbilisi) and Tabriz. Landscapes are varied. Highlands extend far above the timber line and provide rather poor pastures. Settlements vary from mud hovels, partially underground to better cope with the severity of winter cold, to attractive settlements of German Mennonites, or Persian-type oasis towns. Down in the deep valleys are rice fields cultivated with the aid of water buffaloes. Here and there a camel

caravan lends contrast to horse-drawn cart transportation, or automotive transport along occasional highways.

Tabriz, a city of about 215,000 in northwestern Iran, is the leading political and commercial center of one of the most densely populated parts of Persia, the fertile Adshi Chai valley and borders of Lake Urmia. The people are mainly Tataric-speaking and culturally similar to the rural Azerbaijanian to the north, a fact that has turned many political sympathies toward the Soviet Union. Lines of communication, both railroad and highway, also lead north. World-famous wines and rugs are exported from Tabriz. Persian-speaking peoples live in a narrow strip west of Lake Urmia.

Eastern Turkey is mostly Armenoid and Armenian-speaking, but in this wild, nomadic territory there are many Iranic-speaking Kurds, especially toward the east and south. There are also various Turkish-Tataric speakers, especially north of Lake Van.

IRANIAN PLATEAU

Southeast of the high mountains of Armenia and Kurdistan is the extensive Iranian Plateau, extending to the highlands of Afghanistan and the borders of India. To the north is the low Caspian Depression. To the southwest are Mesopotamia, the Persian Gulf, and the Arabian Sea. Politically this area lies in Iran (Persia), Afghanistan, and Baluchistan. Altogether it comprises an area of about 954,000 square miles inhabited by about 29.4 million people, a population density of less than twenty-eight per square mile, which is less than half that of Turkey but about three times that of Arabia.

Most of the people of the Iranian Plateau and its immediate highlands are Caucasoids, the predominant stock being Irano-Afghan Mediterranean. These people are tall, long-faced, high-headed, and commonly have conspicuously hooked-noses. They have been invaded by various Mongoloids with rounder heads. Complexions vary from dark to relatively fair. Indo-European languages of the Iranic family are dominant. Tataric and other Ural-Altaic tongues prevail in the northwest and at various places eastward. Mohammedanism, the leading religion, is represented mostly by the Shiite branch which rejects many of the orthodox beliefs and practices of Islam. There are remains of the Nestorian Christian Church in Persia and a considerable number of Zoroastrians. To the northwest Armenia is predominantly Christian, with a church of its own

which acknowledges the Pope of Rome, but follows the ritual of the Eastern Church.

Population density reaches a maximum across a belt from the Caspian to the head of the Persian Gulf. The southern part of this region was Ancient Persia. The old Elamite civilization centered just north of the Persian Gulf. Sometime prior to the seventh century B.C. trade routes led north to the vicinity of Tehran, and eastward across the northern part of the plateau to Bactra (now Balkh) in northern Afghanistan, then along the valley of the Amu Darya and across Pamir to Tarim. Silk and gold came westward from China to Persia. By at least 510 B.C. commerce was also taking place with India by means of boats using coastal routes beyond the Persian Gulf. Susa, a short distance southwest of existing Dizful, was the center and most important capital of ancient Persia. The military prowess of ancient Persia received a severe blow in 480 B.C., when Xerxes was defeated at Thermopylae, about ninety miles northwest of Athens. Long centuries of decline witnessed invasions by Saracens, Armenians, and various Mongoloid peoples from the northeast.

A people commonly ascribed to Persian origins,

but bearing a corrupted form of "Egyptian" as their name, the Gypsies, are in reality descended from outcast groups from many lands. Some originated in India and are racially Mediterraneans. After a considerable sojourn in Persia, many of them wandered westward into various European lands and to the Americas, where they have remained foreigners, clinging to much of their original language and culture, though Romany, their original Indic tongue, now has many dialects.

IRAN

Iran (Persia), 628,000 square miles and 20 million population, has somewhat the shape of a sugar scoop tilted eastward. Rather continuous highland rims flank either side, with the main plateau sloping and widening eastward toward the desert of Lut and the large enclosed basin of Seistan in southwestern Afghanistan. Most of the interior drainage is eastward toward deserts. The real granary of Persia lies in Azerbaijan, at the head of the scoop. Turks, Kurds, and Arabs of the western uplands are noted pillagers and robbers who resist governmental control. Social and political organization is largely on a tribal and patriarchal basis in the manner of the Dry World.



Iranian Plateau: index map

The sedentary agricultural population of the fertile valleys is not only busy with crops, but is also occupied in turning out shawls, rugs, and other textiles that have claimed world renown.

Kurdistan, Luristan, and Arabistan are the three major divisions of western Iran, from north to south between Azerbaijan and the Persian Gulf. The first two are highland regions with fertile valleys. Arabistan has its highland to the east and north, with its more significant lowland, the heart of ancient Persia, toward the south. The Zagros and other mountains of western Iran rise more than 8,000 feet, and in a few places above 12,000. Sheep, goats, and cattle in the highlands produce considerable quantities of butter and cheese. Hamadan is a tanning and hide-processing center. Rugs and woollens are produced throughout the mountainous district of western Iran. Outside communications are chiefly to the west. An important commercial route leads by rail from Baghdad to the Persian border, and then over roads through Kermanshah, Hamadan, and east to Tehran.

Arabistan extends into the southeastern part of the Mesopotamian plain, to Shatt-al-Arab, the main western tributary of the combined river delta. A refinery and shipping port for Iranian oil, which is produced in territory near the head of the Persian Gulf, has been established on the delta island of Abadan. Some petroleum is also produced in western Kurdistan, near the fields east of Mosul. Bandar Shahpur, just east of the delta, is Iran's most important seaport, at the

terminus of a railroad completed in 1938 which leads north to Dizful, Hamadan, Tehran, and Bandar Shah, on the Caspian. The Karun River is navigable for a considerable distance along its floodplain course. Dates are grown in the Arabistan lowlands, and various Mediterranean crops in the district south of the mountains.

Mountain trends parallel the eastern side of the Persian Gulf. "Hot lands" extend along the coast, southeast of Arabistan. The January temperature averages reach almost 60° F. in the extreme south, and July rises to the vicinity of 90°, which means many days in excess of 100°. Annual precipitation is less than ten inches, so the climate is hot desert. Bandar Abu Shehr (Bushire) is the port terminus of a short railroad to Borazjan and the main outlet of interior Shiraz. Bandar Abbasi, across the Strait of Hormuz from Oman, was formerly the main southern port of Persia, with overland connections north through Kerman, Yezd, Isfahan, Kashan, and Tehran, or through Tabas to Mashad in the extreme northeast. The British occupy several islands at the strategic neck of the Persian Gulf, as well as Cape Dschask (Jask) on the desert mainland. The flow of Anglo-Iranian oil by tanker through the Persian Gulf is thoroughly under the control of these fortified outposts.

On the inner side of the rather inhospitable ranges north of the Persian Gulf are many of the leading oases of Iran. Such rain as falls is con-



Abadan oil refineries (U.S. Army photograph)

centrated in the cool season and therefore useful for wheat. Summer is the season for harvest of a variety of fruits and the growing of rice, millet, maize, cotton, opium poppies, and tobacco. Isfahan, with a population of 205,000, is the leading metropolis of the oasis belt. Though the annual rainfall is less than five inches, the Senda (Zaindeh) River provides ample water for irrigation and domestic supplies. As a center for making brass and other wares, rug industries, and opium processing, Isfahan is one of the most interesting and distinctly oriental cities of Iran. Kashan, to the north, turns out silks, sateens, velvets, and brocades, in addition to processing tobacco and various food products. Yazd and Kerman, to the southeast, are centers for rice, cotton, tobacco, henna, and opium. Kerman carpets are made of cotton. In the hills to the west, gum tragacanth is collected and local centers weave woolen rugs and fabrics. Shiraz is a relatively important commercial center for the region, with access to the coast. A good deal of agriculture depends on the development of water supplies by a system resembling the foggaras of the Libyan and western Algerian oases. Kanats (karez), or networks of small tunnels leading up to sources of supply, carry water for irrigation and domestic purposes.

These covered channels reduce evaporation losses. They are tapped through various openings and lead to oasis ditches.

Tehran, 1,000,000, the capital and leading city of Iran, lies across the high Elburz Range from the southern end of the Caspian Sea. Mt. Demavend, rising to 18,605 feet above sea level, looms about fifty miles to the northeast. Fertile agricultural valleys, with adequate mountain water for irrigation, lie nearby. Tehran occupies an important crossroads site. It is squarely on the caravan route between Mashad, and all eastern points, to Hamadan and Baghdad and an alternate route to Tabriz, Erivan, and across Anatolia, through Ankara. Various trails lead to the Caspian and several to the oases to the south. It now has the advantages of railroad and highway connections in several directions; automobile roads leading to Mashad, to Enzeli (Pahlevi) at the southwestern corner of the Caspian, to Trabazon at the southeastern corner of the Black Sea, to Baghdad, and to the main cities to the south. Highways connect it with the Soviet railroad system at Askhabad (to Bukhara, Tashkent, etc.), and rails run the entire distance across Armenia to Tiflis. Most of the growth of Tehran has occurred since 1920. The older parts of town contrast sharply with the modernistic architecture of the newer. Industrial development has occurred in textile and other



Tehran street scene (U.S. Army photograph)

lines, but only in a limited way. The main interests are political and commercial.

The northern rim of Iran is highest along the Elburz Range. To the east are the Alla-Dagh, Kopet-Dagh, and other ranges leading east to the high Hindu Kush of northeastern Afghanistan. Annual precipitation is in excess of 50 inches in the Elburz, and is much heavier on north slopes than on the south. Snow-capped peaks rise high above extensive alpine pastures and forests. The Caspian lowlands grow rice, cotton, olives, lemons, citrons, various deciduous fruits, and sugar cane. The lowest flats are malarial, and most towns lie back some distance from the shore in higher and more healthful settings. Territory near the delta of the Qizil Uzun, long famous for silk production, is now concentrating on rice. Resht (Gilan), leading market town of the Caspian Coast, is served by the seaport of Enzeli (Pahlevi) which carries on an active trade with Soviet Caspian ports. The Masanderan Coast to the east is less important, but now that Bandar Shah has become terminus of the trans-Persian railroad considerable commercial activity should stimulate development.

Roughly one third of Iran's population consists of pastoral nomads. Many of these inhabit the arid interior, especially in the western part, where elevations are between 4,000 and 8,000 feet above sea level and extensive areas are covered by steppe vegetation. Various hills and uplands rise above vast surfaces of reg. Much of the bedrock is limestone, which dries rapidly after rains. Precipitation decreases eastward, over half of the country receiving less than five inches. Two thirds drains into interior basins, flooded by extensive salt flats or saline lakes. The extensive Dash-i-Kavir, south of the route from Tehran to Mashad, is a salt desert, hot and dry in summer, bitterly cold and bleak in winter. To the southeast is the even more arid Dash-i-Lut, with extremely hot summers. Oases extending from the vicinity of Mashad, through Tabas, to Yazd, in a reg district between the main deserts, produce cereals, tobacco, opium, and other crops. Much of the territory near Mashad is reg suitable for grazing, yielding a surplus of wool, hides, and clarified butter. Sandfields are not so extensive in the Iranian as in north African deserts. Instead of broad erg areas, sand tends to be heaped into individual dunes, some of which are several hundred feet high. The localization of sand into dunes is an indication of rather deficient supply; were there more sand, it would be spread into lower, irregularly surfaced ergs. Southeastern Iran is almost uninhabited, so intense is the aridity and summer heat.

To the rest of the world Iran is important

because of its petroleum resources. Petroleum accounts for more than half of the value of all exports. Rugs, carpets, and textile products are second in importance. Cotton, fruits, wool, hides, and rice are in surplus, most exports being taken by the Soviet Union. Iran is also an exporter of opium, gums, and various other drugs.

Most of the petroleum is produced in fields operated by the Anglo-Iranian Oil Company, which has a concession on a very large part of the country and takes its main output from wells near the head of the Persian Gulf. Here is the backbone of the British petroleum industry. American interests have concessions in eastern Iran. The Soviet Union has some concessions in the north, mainly in land generally thought to be unproductive, but these concessions permit exploratory operations and contacts calculated to keep northern Iran within the Soviet Union sphere of influence.

On the whole, mineral resources are only partially known or developed. Coal exists on both slopes of the Elburz and is mined mainly near Tehran. Turquoise mines have long operated near Mashad. Iron, copper, lead, manganese, nickel, and cobalt are produced in small amounts. Non-metallic mineral products include salt, borax, and marble.

BALUCHISTAN

To the southeast of Iran is Baluchistan, 80,000 square miles and 356,000 population, a density of less than 4.5 per square mile. Long under British control and politically part of Pakistan, most of Baluchistan is typical Dry World territory. Its low population density and small total number of inhabitants are suggestive of its extensive deserts.

Baluchistan is separated from Sind by the Kirthara Range, which extends from Karachi and attains elevations in excess of 7,000 feet. Desert territory, with unimportant oases and an extremely barren coast, stretches westward to Iran. It was along this coast that Arab navigators experienced greatest hardships in carrying on trade with India. Oman still owns the port of Gwadar near the Iranian border. The territorial boundary swings east from the northern part of the Kirthara to the southern end of the Sulaiman Range, which it follows northward to the Gomal Valley, west of Dera Ismail Khan. A considerable part of eastern Afghanistan, as well as the entire southern boundary, is thus hemmed in by Baluchistan. Lowland between the two eastern ranges leads to Bolan Pass, with its 6,000-foot summit

crossed by rail to Quetta, the capital. This town of 50,000 was practically demolished by an earthquake in 1935, but has been rebuilt. Here, where the precipitation amounts to about ten inches annually, are raised sorghum, the main cereal food of the country, wheat, barley, and fruits. The Sulaiman Range, rising above 11,000 feet in the north, presents a formidable barrier toward India.

Quetta has some commercial importance as a route center. From it a railroad extends westward, along the frontier, to Duzdab in Afghanistan. From Duzdab an automobile road leads north to Mashab, a trip requiring four days, whereas by caravan it formerly took from four to six weeks. A short line leads from Quetta northwestward, connecting with a road across Kojak Pass to Kandahar in Afghanistan, which is on the main automobile road of that country from Kabul in the northeast around a long southern arc to Herat in the northwest.

AFGHANISTAN

The dominant state of the eastern part of the Iranian Plateau is Afghanistan, with 250,000 square miles and a population of 12 million. Its independence is a result of its importance as a buffer between the British Lion of India and the Russian Bear of both Czarist and Soviet times. Its importance lies in passes, which lead from the Indus Valley to the Amu Darya. It also commands routes to Tehran. The routes of Afghanistan are not so important from the standpoint of what passes over them as from that of what might. In centuries past various peoples crossed the high passes of Afghanistan to invade the lowlands of India. Languages, religions, and other culture traits have crossed the Afghan barrier. In modern times, the main concern of the Russians has been the possibility of a British thrust toward trans-Caspian lowlands and that of the British has long been the fear that Cossacks, Turks, or other peoples might pour into India. Astride the high Hindu Kush and ranges to its west lies the anomaly of a route state without railroads, or much other than very primitive means of communication, a backward land of wild Pathans, Tadjiks, and somewhat more advanced Durani.

The population is mainly of Irano-Afghan Mediterranean stock and speaks Indo-European languages, though there is a good deal of Mongoloid admixture to the north where Indo-Iranian tongues are largely replaced by Ural-Altaic. The people to the east and south speak Pashto, a tongue

that extends into Baluchistan and India. Those to the west speak Persian and Iranic dialects. The religion is almost solidly Mohammedan.

Easternmost Afghanistan extends as a tail along the Hindu Kush to the border of Sinkiang Province, China. Across this strip, which is nowhere over 40 miles wide, are Dorah, Nuksan, and Baroghil passes between the upper Indus Valley and the upper Amu in Badakhshan Autonomous Territory of the Tadjik S.S.R.

The most famous pass of Afghanistan is Khyber, between Kabul and Peshawar. Indian rail communications are supplemented by an automobile road that winds across the mountains slightly south of the Kabul River which cuts through an impassable gorge. To the south is Paiwar Pass, leading to the Kurram Valley and railroad terminus of Thal. Farther south, Kotanni Pass leads either to the Tochi Valley, between Peshawar and Dera Ismail Khan, or to Gomal Pass and the latter. There are also many other obscure and little-used trails to the Indus, but practically all trade goes through Khyber.

Northwest of Kabul are Shibar and Irak passes across the western end of the Hindu Kush to Balkh (Bactra). Automobile roads lead by these routes to Termez, in Uzbek S.S.R., with railroad connections into the Soviet system. Balkh lies on ancient routes to Mashad and Tehran.

Large areas are suitable for agriculture. Winter crops include wheat and barley. Millet, maize, rice, and tobacco are summer crops. Some precipitation comes in winter, but spring is the season of maximum rainfall. Snow from mountains supplies water for irrigation. Apples, pears, peaches, quinces, apricots, plums, cherries, figs, pomegranates, and almonds are produced in orchards. Castor beans and carrot-like plants that supply asafetida are among medicinal crops. Madder is a red dyestuff. Silk is produced along the Amu Darya, to be exported mainly to Iran and the Soviet Union. Mineral resources include little-worked deposits of copper, lead, iron, silver, and some coal. Petroleum occurs in the north and west.

Though their natural resources are fairly attractive, the Afghans prefer nomadic to sedentary pursuits. In a land averaging over 4,000 feet in elevation, between the extremes of highest Hindu Kush territory rising to over 25,000 feet, with a broad alpine zone, and the low, extremely hot and barren Registan Desert southwest of Kandahar, are rough grazing lands much to their liking. Here they raise sturdy ponies, camels, cattle, goats, and the native fat-tailed sheep. The tail fat is important in Afghan and many other Turko-Mongolian Realm diets as a substitute for

butter. In the northern part of the country an important source of revenue is the karakul lamb, with tightly curled, glossy, black wool.

Commerce and industry specialize in animal products. Hides, wool, textiles, sheepskin coats, and ghee, a clarified, semifluid butter, made by melting butter from various animal milks, cooling, and pouring off the more liquid part (ghee), are among the leading exports. Raw silk, fruits, and nuts are also produced beyond local needs.

Kabul, 206,000, the capital, is the leading political and educational center. Though remote and primitive, and long the center of such sights as prisoners in cages along trails or roads, who

might survive if they had friends willing to supply them with necessities of life, it is recently making considerable progress. Under the reforms of 1932 slavery was abolished, voting privileges extended widely, and education made compulsory. Foreigners, many of whom were Americans, were brought in to modernize ways of living and to improve the agricultural and industrial position of the country. Herat, 100,000, in addition to being a route center, has considerable textile industry making silks and woolens, particularly rugs and carpets.

33: Turan and Its Eastern Borderlands

The Dry World north and northeast of the Iranian Plateau is typical Turko-Mongolian territory. Ural-Altaic Turkic languages are spoken by Turkomans, Uzbeks, Uigurs, Tataric tribes, and other peoples who extend from the Caspian across the arid belt to Mongolia. In the extreme east and in Tibet are Chinese and Indo-Chinese languages. The population is predominantly Mongoloid.

TURAN

The trans-Caspian or Turanian depression is a continuation of the Siberian lowland southward, into arid territory. During the Ice Age, when a vast western Siberian lake existed, its outlet flowed southward into the Caspian and from thence west, into the Black Sea. The Arctic-Caspian divide now occurs in about the latitude of 50° N., but is gentle. The contrast between typical Siberian and typical Turanian lands is fundamentally a matter of climate and vegetation. Turan is essentially a region of pastoral nomadism, desert, and oasis agriculture. Siberian lands are useful for field agriculture, or grow forests.

From the cultural standpoint, Siberia has become an eastern wedge of the European World, dominated by peoples who speak the Great Russian language. Turan is being invaded by European ways, especially in urban centers and in local areas possessing mineral wealth. Much of it is practically uninhabitable. The better steppe lands to the north are in the hands of Kirghizic-speaking nomads. The better lands around its eastern and southern fringes are thoroughly dominated by well-entrenched Turkic-speakers.

As a culture region, Turan spills over into Europe to a small extent, its western transitional zone being in the very arid territory west of the Volga, essentially the Kalmyk Autonomous Territory of the Russian Socialist Federated Soviet Republic. East of the Volga it extends about along the boundary of the Kazakh Soviet Socialist Republic as far as longitude 60° E. (the main meridian of the Urals), and from thence about along the divide between Arctic and interior drainage to the western end of the Altai. The eastern bound-

ary runs generally southwestward between the western Altai and the Afghanistan frontier north of the Hindu Kush Mountains, leaving only the highest parts of the western ends of the great central Asiatic ranges to its east. The southern boundary extends from the upper Amu Darya Valley to the Caspian, along the Afghan-Iranian frontier.

Politically all of Turan lies within the Soviet Union, being divided among five republics as follows:

Table 21 Approximate areas and populations of Turanian Soviet Republics (1946)

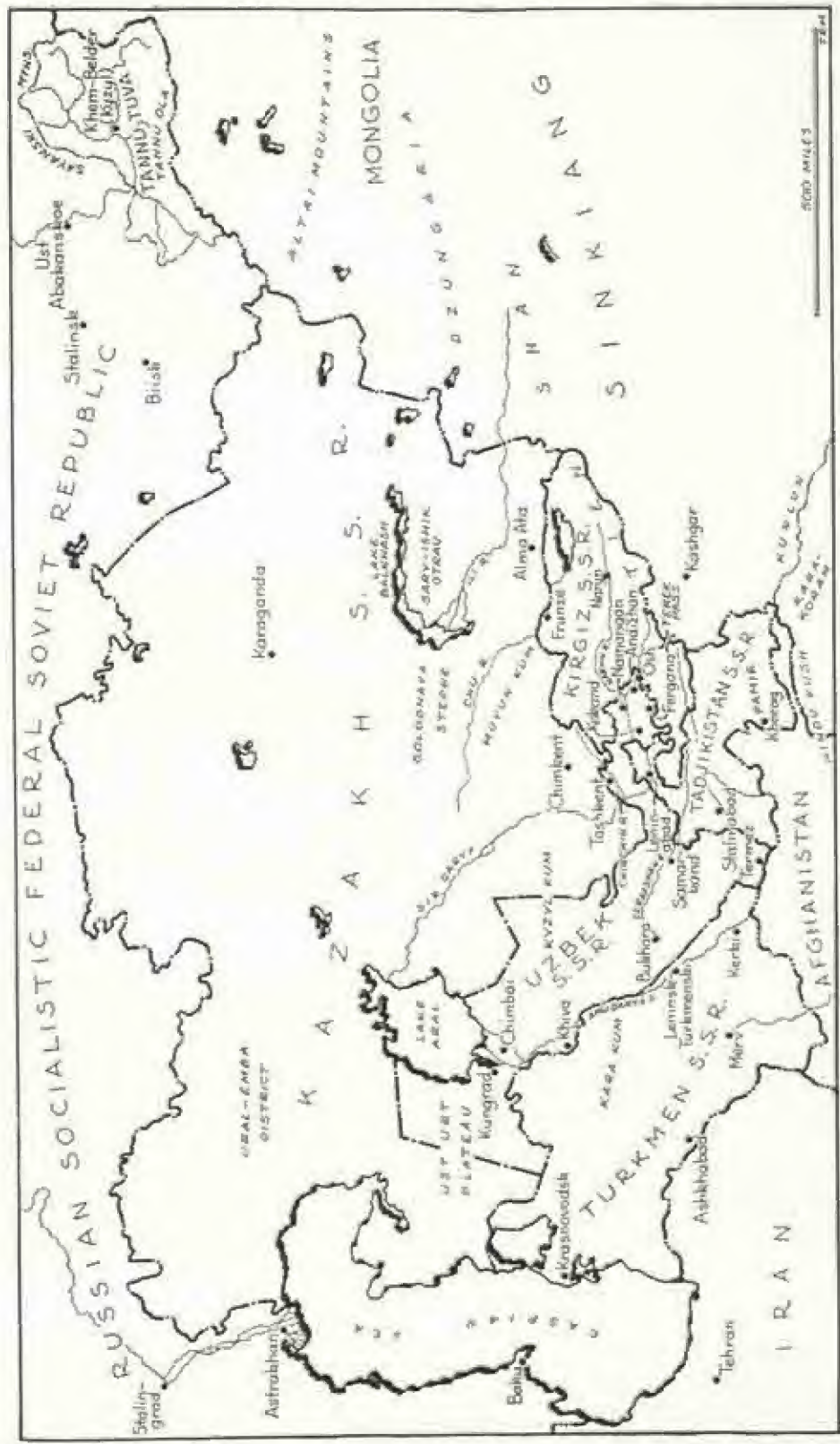
	Area (thousands of square miles)	Population (millions)
Turkmen S.S.R.	171	1.25
Uzbek S.S.R.	146	6.28
Tadjik S.S.R.	56	1.49
Kirghiz S.S.R.	76	1.46
Kazakh S.S.R.	1,059	6.15
	1,508	16.63

The areas and populations of the five republics are somewhat greater than those of Turan, because they include lands that are culturally Siberian to the north and considerable areas of highland that are not typically Turanian to the east. Turan covers an area of about 1 million square miles and has a population on the order of 15 million.

CULTURE BACKGROUND

Southeastern Turan has been the traditional home of Turkic peoples since prehistoric time. It contains many fine oases and broad zones of good grazing land along the flanks of the central Asian mountains, making it a prize for nomadic invaders. These have arrived at various times, mainly from the east.

The Dzungarian Gate is one of the great corridors from central Asia to the west. Steppe lands lead across much of Mongolia to a narrowing belt just north of the Tien Shan and its eastern extensions, through Dzungaria, and by two or three comparatively easy routes to the vicinity



Turani Index map

of Lake Balkhash. Chinese, Tatars, Mongols, and other peoples have come westward along this route. Many were attracted by the grazing lands leading across northern Turan to the steppes of southern Russia. Others continued southwestward across the good lands of eastern Turan, into Turki territory.

The Chinese, at about the beginning of the Christian Era, ruled lands as far west as Lake Aral. In the thirteenth century Genghiz Khan with his horde of Mongolians appeared. The Chinese came again, early in the eighteenth century. In addition to these invaders from the east, Alexander the Great conquered Samarkand and Tashkent in 329 B.C. and the Arabs reached Turan in the eighth century A.D.

From the political standpoint, Turan was most important during the latter days of the Khan empires. Timur (Tamerlane) made Samarkand his capital in 1370. It was one of the most lavish, enlightened, and powerful cities the world has known. After the death of Timur, in 1405, the great empire crumbled. The Ottoman Turks, who replaced the tolerant and learned Mongols, were people of an entirely different stripe. They hated all foreigners, had no respect for cultural refinements, and were ruthless conquerors and administrators. After a long period of decline, Tashkent was captured by the Russians in 1866 and Bukhara in 1873. It remained for Soviet control, however, to advance the lot of Turanian peoples or to bring about anything more than nominal development of their resources.

The Arabs brought Mohammedanism which is now implanted solidly in Turan. Most traces of Christianity, which dates back to the Khan days, disappeared. Far Eastern religions failed to penetrate Turan successfully.

The population is predominantly Turkoman in cities, oases, and better agricultural districts. Nomadic Tadzhiks inhabit the highlands to the southeast. Afghans and Persians have spilled northward to some extent. Kirghizic-speaking nomads and Tatars extend across northern Turan, both across plains and the northeastern highlands. Alpines and Russian-speakers are the most recent invaders, particularly in the north.

CULTURAL LANDSCAPES

Most of Turan receives less than ten inches of precipitation annually. About half of it receives eight inches or less and is desert. Bukhara, by no means the most arid location, has a four-inch average. January temperatures average be-

low freezing, except in the extreme south. Occasional drops to -10° F. and lower make it necessary to protect animals against winter cold. Summer temperatures average above 80° over all lowlands and occasionally rise to 110° or more.

The main desert belt of Turan extends from south of Lake Balkhash southwestward to the Caspian. The Muyun Kum is predominantly a reg and salt-flat desert southwest of Balkhash. To the northeast, within the arc of the lake, is the saline Sary-Ishink Otrau. To the west is the Kyzyl Kum, with extensive erg. Beyond the Amu Darya is the sandy Kara Kum (black sand), with extensions across lowland to the southeastern Caspian. The Ust Urt Plateau, between Lake Aral and the Caspian, is mainly reg and hammada. Aside from oases and centers established along routes, these desert regions are practically uninhabited.

The value of steppes is somewhat reduced by tendencies toward precipitation maxima in spring. Late summer finds grass withered and sources of water dry. Pastoral nomads have long been tempted toward steppe to the west, where more rain falls during summer. Those who remain in Turan are inclined to emigrate to upland pastures, or else practice transhumance. Some journeys from spring to late summer pastures are extremely long. There are about 5,000 lakes in the Kirghiz Steppe, but most of them are playas that become saline flats each late summer. Lake Balkhash, the largest, though fed by several streams, is saline. Less brackish and somewhat potable water exists near stream mouths. The Golodnaya, or Hunger Steppe, west of Balkhash, is inhabited by a small group of Kirghizic-speaking nomads. Elevation drops from about 900 feet at Balkhash to 157 at Lake Aral. The domestic animals of the Kirghiz are horses and fat-tailed sheep.

Living in collapsible, felt-lined *yurts* (a type of tent in use as far east as Mongolia), ranging widely, and depending almost wholly upon animals for food, shelter, and livelihood, the Kirghiz are commonly considered as being the most purely pastoral nomads on earth. Their domain shades off northward into areas of marginal dry farming, mainly on state-owned farms.

Streams fed by some of the highest mountains on earth enter Turan from the east. The Ili, which flows into the southern part of Lake Balkhash, is important as a route, but only in its upper part, where its valley offers one of the several ways to reach Turan and other western territories from the high plateaus of central Asia. The Chu River leads from the northern slopes of the Tien Shan into the inhospitable wastes of the Muyun Kum.

Neither of these major rivers has proved useful enough to be followed by oases leading into the desert.

The Sir (Syr) Darya is one of the two main "Niles" of Turan. It rises in the western Tien Shan and flows into the important valley of Fergana, 180 miles long and 100 miles wide, one of the most densely populated regions in the Soviet Union. Fed by melting snow, the irrigation ditches are fullest in summer when water is most needed. Cotton is the principal crop. Its cultivation was started in Czarist days and stimulated by industrial activity in Moscow when the wealth of the nobility turned toward textile enterprises. The railroad to Moscow follows a direct route along the Sir, north of Lake Aral, through Orenburg. From Fergana comes the best cotton of the Soviet Union and from Turan in general enough to free the Union from dependence on foreign supplies. In addition to cotton, Fergana grows other typical Turanian crops, wheat, barley, vegetables, flax, sesame, sugar beets, melons, and such fruits as apricots, peaches, cherries, plums, and apples. Grapes are grown for raisins rather than wine. Andizhan, Fergana, Leninabad (Khojent), Namangan, and Kokand are thriving agricultural centers, all served by rail connections.

Fergana is one of the gateways to the Tarim Basin, east of the Pamirs. Marco Polo detoured an ancient route and one of the main commercial connections between the Far East and western lands when he avoided the trail from Andizhan to Osh, crossing Terek Pass to Kashgar (Shufu). Several other passes lead from the Naryn Valley to Tarim, or to Frunze and the Dzungarian Gate. Osh is a center for routes southward, across high passes, one of which is now followed by a road to Khorog on the upper Amu Darya.

Tashkent, 585,000, on the Chirchik, a tributary of the Sir, not far below Fergana Valley, is capital of the Uzbek S.S.R. and the leading industrial city of Turan. It manufactures textiles, steel, and agricultural products. Mineral resources within the republic include coal, petroleum, sulphur, and copper. Karakul fur, ordinary wool, and hides are among its surplus commodities. Rail connections lead to all southern Turanian points and eastward to Frunze, capital of the Kirghiz S.S.R. The latter line passes through the Chirchik mining district, a source of lead, and carries goods destined for Dzungarian Gate roads to interior Asia and the Far East.

The Kirghiz S.S.R. is comparatively small and restricted to mountainous territory north of Fergana and east along the Tien Shan to Tengri

Khan, a peak rising to 23,622 feet. It is rich in minerals, including lead, zinc, copper, tin, gold, silver, and petroleum. Agricultural products include wheat, rice, sugar beets, tobacco, vegetables, and fruits. Most of the inhabitants, however, are interested in nomadic pursuits and produce a valuable surplus of karakul, wool, and hides. Their domestic crafts are concerned mainly with weaving rugs, preparing hides and leather, making saddles, and similar articles.

The giant Kazakh S.S.R. covers the vast Kirghiz Steppe from the borders of the conventional boundary of Europe, south of the Urals, to the Dzungarian Gate. Its capital, Alma Ata, 231,000, lies far to the east in territory that raises livestock, wheat and other grains, and which commands the Ili Valley route to central Asia. The railroad from Turan to Siberia passes through Alma Ata. To the north, across deserts and Lake Balkhash, is the great Karaganda industrial region. Far to the west is the Ural-Emba petroleum region. Both of these European World outposts in the Dry World have introduced ways of life very foreign to the Kirghiz-speaking nomads who range over the intervening territory.

South of the Sir is the Zerafshan Valley which leads west from the high Tadjik S.S.R. past Samarkand and Bukhara. Though tributary to the Amu Darya, the second of Turan's "Niles," no water from the Zerafshan reaches the Amu by surface flow. Evaporation is intense, the ground porous, and demands for irrigation are heavy. Barley is grown along the upper valley, in Tadjikistan, to elevations of over 8,000 feet. A deciduous fruit zone occurs somewhat lower. Grapes reach about 6,000 feet. Millet, maize, and rice are the main cereal crops in the lower valley, at levels up to about 4,000 feet.

Samarkand, in Uzbek S.S.R., was known to ancients of the eastern Mediterranean, who called it Maracanda. Alexander the Great conquered and destroyed it in 329 B.C. Timur made it his capital and one of the jewels of the Mongol-Mohammedan world. Mosques, tombs, and public buildings elaborately covered by turquoise tiles remain from its early fifteenth-century glory. Its arcaded passages and eastern atmosphere would attract a tremendous tourist trade were it the policy of the Soviet Union to permit such development. As an agricultural center it now has a population of 136,000 in the central city and about 200,000 with suburbs. Bukhara, the last Zerafshan oasis, at the southern extremity of the Kyzyl Kum, is an important route center. It lies on the main railroad from Tashkent to the Cas-

pian via Merv (Mari) and on a branch to Termez and other points up the Amu. Its population is somewhat over 50,000.

The Amu Darya (Oxus) leads from the Pamirs to Lake Aral. The upper valley is divided between Afghanistan and the Tadjik S.S.R. Stalinabad, capital of Tadjikistan, is a city of about 60,000 on a rail line from Termez. Cotton and various other crops are grown along the upper Amu tributaries. Mineral resources include lead, zinc, silver, cadmium, vanadium, molybdenum, and uranium. To the northwest, the Amu leads through desert with large ergs. A string of oases follows the river between Kerki and Kungrad and Chimbai, on the delta. Khiva, known to the Ancients as capital of Chorasmia, now an outpost in western Uzbek S.S.R., is the most notable, having a population of about 20,000. Leninsk-TurkmenSKI, on the railroad, is noted for fine melons. Lake Aral, like other terminal desert lakes, is saline and variable in size. Most of it is less than 40 feet deep and it contains many barren islands.

The Murghab, which is followed by a railroad from Kushka, outlet for Herat, in western Afghanistan, to Merv (Mari), ends in Kara Kum sands long before reaching the Amu. Cotton, grain, oil seeds, and similar crops are grown along its course. Ashkabad (Poltoratsk'), capital of the republic and center of trade with Mashad, has a population in excess of 100,000. Krasnovodsk, the terminus of the railroad from Merv, is a Caspian port for steamers to Baku. Coal, petroleum, sulphur, barite, lime, and gypsum are the main Turkmen S.S.R. mineral resources. Eighty per cent of the republic lies in the Kara Kum. Winter is fairly mild along the foothills north of the Iranian border, but summers are extremely hot, temperatures rising above 110° F. several days each summer.

It is estimated that about 15 per cent of lowland and foothill Turan is under cultivation. Cotton is the important cash crop. Rice is raised wherever water is available in sufficient quantity. Most crops are irrigated, but some cereals are raised by dry farming. The nomadic peoples are mainly Kirghizic speaking. The urban population and the agriculturalists are mainly Turkic speaking. The most advanced and civilized of the Turkic peoples are the Uzbeks, who are dominant in the fine lands and oases from Fergana to Bukhara.

European World impacts are comparatively recent, the most important dating since about 1930. An effective railroad net is supplemented by air-

lines, which have been carrying rather heavy traffic since 1935. Agriculture has been stimulated notably. Industry has arisen rather modestly, except in the north where the Karaganda district has come to be the third most important coal region of the Soviet Union. Smelting towns have sprung up on the steppe to the west of Lake Balkhash. Mineral resources have been highly developed at Chimkent and other centers. One of the most interesting ventures of recent years is the attempt to collectivize the nomads, organizing their ancient manner of living along patterns taken from industry, so that neither risk nor prospect of extraordinary profit shall result from their venturesome and rigorous occupation.

CENTRAL ASIAN MOUNTAIN KNOT

The Pamir Plateau, "roof of the world," is a nodal point in the east-west Eurasian mountain barrier. Toward it converge the Iranian highlands, the Hindu Kush of northern Afghanistan, and the Sulaiman Range of western India. The Trans-Altai, of its northern flank, runs westward between the valleys of Fergana and the upper Amu. Here rise the relatively high Peter the Great Mts., and Mt. Stalin, 24,589 feet, highest peak in the Soviet Union. To the northeast run the "Heavenly Mountains," the Tien Shan, with culminating crests only slightly lower than the mighty Stalin, and prongs toward Gobi between Tarim Basin and Dzungaria. Beyond Dzungaria is the Great Altai, the Tannu Ola, Sayanski, Khangai, and other highlands leading to the Yablonovi and Stanovoi, a trend that extends northeastward to Bering Strait. To the east from Pamir is the Karakorum, highest range on earth, although some of its summits are exceeded by those in the Himalaya. Godwin Austen rises to 28,251 feet, falling to equal Everest by somewhat less than 900 feet, or just about the height of the Eiffel Tower. Four New York skyscrapers more than span the interval between the giants of the two ranges. To the east of the Karakorum is the Kunlun, trending eastward across Tibet toward the Tsining Shan of China. Branching at a slight angle to the north is the Altyn Tagh, along the northern border of Tibet. This trend becomes the Nan Shan and continues eastward in an arc that swings into the Great Khingan, dividing range between Mongolia and Manchuria. Southeastward from the Karakorum are the Trans-Himalaya, north of the upper Brahmaputra (Tsang Po, of Tibet), and the Himalaya to the south. Several other ranges extend across parts of Tibet. Eventually some of the trends turn southward into Malaysia and the East Indies,

To Europeans the Pamir and other central Asiatic highlands have been not only remote, but difficult to reach on account of political restrictions and prejudices of peoples who inhabit them. Though Marco Polo named the Pamirs in 1273, it was not until 1838 that another European saw them.

The Turkic tribes of the highlands and the Iranic Tadjiks of the western flanks of the Pamir use grazing grounds separated by a forest belt, between dry and cold timberlines. This forest resembles the taiga and occurs along a zone from somewhat above 5,000 to about 9,000 feet. The lower grazing zone serves flocks that winter still lower. The upper grazing zone is used throughout the year, its inhabitants moving to sheltered places on south slopes during the cold season.

Many glaciers rise in the central Asian highlands, some extending down valleys for nearly fifty miles. During the Ice Age these ice streams were considerably longer, but no great continental ice cap collected because precipitation was insufficient. Terminal moraines mark both ancient and modern ends of individual valley glaciers. Many beautiful lakes, *turns* scoured by ice, lie in strings up the higher valleys. Surrounding landscapes are typical of the alpine variety of tundra, soils being frozen for many months per year and saturated on flats during summer thaw. Particularly scenic glaciers descend the valleys of Mustagh Ata, a 24,357-foot peak in the eastern Pamir region. The Tien Shan, highest range north of Tibet, also has many active glaciers. Oases fed by glacial streams are especially favored, because the flow of water is thoroughly dependable.

CENTRAL ASIAN SOVIET FRONTIER

Russian Turkestan is an old name for Turan. To the east of the central Asian mountain knot and northeastward was Chinese Turkestan. Beyond the Altai is northwestern Mongolia. The Pamir lies within the Soviet Union.

Rail communications are fairly well developed along borders of the Soviet Union. Most of the boundary of Iran lies not far from the line between the Caspian and Tashkent. The main centers of northern Afghanistan, Herat and Balkh, are near the termini of Soviet rails. The lines that extend into the Amu Valley, Tadjikistan, and Fergana connect with a route through Alma Ata to Siberian lines. Several branches extend southward, to such points as Bisk, Stalinsk, Ust Abakanskoe, and Ust Kyakhta. This marginal communication system is supplemented by such highways as the road leading from Alma Ata

southward to Issyk Lake, the Naryn Valley, Osh and south to Khorog, and several routes that lead to China. This transportation system is useful not only for military purposes but also in directing commercial relations toward the Soviet Union. The outer zone of China has been allied politically with the Union for some years. The sympathies of most of the population are strongly communistic, and ties with China have been weak.

Mongoloid peoples predominate everywhere to the northeast of Tadjikistan S.S.R. An underlying strain of Paleosiaties, rather close in racial heritage to many American Indians, extends broadly from Tibet to eastern Siberia. Many of the mountain tribes fall into this classification. Most of them speak Ural-Altaic languages, with Turkic tongues predominating to the west and Mongolian eastward. Neosiaties Mongols, Tungus, Chinese, and similar peoples dominate most of the region today and speak either Ural-Altaic or Chinese languages. The Tibetans speak Indo-Chinese languages.

Were it not for the Soviet policy of encouraging the development of distinctive culture traits among various peoples, Great Russian might become the dominant language of Turan and the whole frontier to its east. Most ruling powers try to stamp out culture traits other than their own. Germany has generally done everything possible to Germanize the Lotharingian Corridor. The French have been considerably more tolerant in Alsace. The Uigurs, a Turkic people who extended their control widely over Eastern Turkestan and Mongolia between the eighth and twelfth centuries generally imposed their language on peoples of various ethnic groups within their realm. Soviet policy has been entirely different. People are divided into rather artificial groups, called "nationalities," according to language and other culture traits. As far as possible each of these groups is given more or less autonomy politically, so that, in fact, it tends to become a national entity.

Among the various minorities of the Soviet Union, possibly the Kirghizic-speaking population has received the least recognition politically. Their relatively small "nationality" is recognized only in the eastern and mountainous part of their domain. The huge Kazakh Republic covers most Kirghizic land. As if to carry matters a step farther, Alma Ata, capital of the Kazakh Republic, is a relatively important city to the east of less important Frunze, designated as the Kirghiz capital. Though Kirghiz-speaking nomads graze the lands about and are recruited into the

labor forces of Karaganda and Ural-Emba, those important districts lie within Kazakh S.S.R.

The Iranic-speaking Tadjiks and various Mongol- and Turkic-speaking peoples along the Siberian frontier have been given more or less autonomy.

TANNU TUVA

In the upper Enisei basin between the Tannu Ola and Sayanski Mountains, west of Lake Baikal, was a Soviet republic of 64,000 square miles and 65,000 people, called Tannu Tuva. Formerly part of Outer Mongolia and loosely under Chinese control, this Soviet borderland district is inhabited

mainly by Turkic-speaking peoples, rather than Mongols, but their religion is Buddhist Lamaism as in Mongolia. Khem-Belder (Krasny), the small capital, carries on trade with Ust Abakanskoe on a railroad leading to the Trans-Siberian line.

Little agriculture is possible on the Enisei lowlands. The settled lowland population herds sheep, camels, horses, and cattle. Coniferous forest fringes the lowland in a narrow zone, above which nomads herd reindeer. The main exports are animal products and animals. Philatelists know the country for its picturesque postage stamps.

From the financial and military standpoints, Tannu Tuva was a protectorate of the Soviet Union, with its government patterned along Soviet lines until 1946 when it was formally absorbed into the Union.

34: Outer China

Outer China, a region that was at least under nominal control of China during the days of the Manchu Dynasty (ended by Revolution, 1911-1912), and to some extent since, includes the territories generally known as Chinese Turkestan (Sinkiang), Tibet, and Mongolia. The areas, populations, and present-day political organization of this eastern arm of the Turko-Mongolian Realm of the Dry World are summarized as follows:

Table 22 Approximate areas and populations of Dry World Outer China

	<i>Area (thousands of square miles)</i>	<i>Population (millions)</i>
Sinkiang	706	2.58
Mongolian Republic	580	2.00
Outer Tibet	349	1.50
Inner Tibet		
Tsinghai	271	1.20
Sikang	143	.97
Inner Mongolia		
Chahar	108	2.03
Ningsia	106	.98
Suiyuan	112	2.08
Approximate totals (millions)	2.4	13.3

There is considerable doubt about the number of inhabitants of Sinkiang, Tibet, and Mongolia. Some estimates would increase the values by 5 million or so and others might reduce them by a million. In any event, the whole region has on the order of less than six or eight persons per square mile, a low value for even the Dry World. The United States has an area of approximately 3 million square miles and over 150 million population. Population density in Nevada is about 1 per square mile; in Wyoming, 2.5; Montana, 4; North Dakota, 11. These are the states most like Outer China physically. They resemble parts of Sinkiang and Mongolia, rather than Tibet, a vast upland of alpine tundra and barren mountains with a density possibly as high as five per square mile.

EASTERN TURKESTAN

Sinkiang, as constituted politically, includes a large part of practically uninhabited, northwest-

ern-Tibetan-type territory in the western Kunlung and its flanks and along the Altyn Tagh. To the north is Tarim Basin, the heart of Eastern, or Chinese, Turkestan. Still farther north is the eastern part of the Tien Shan, with projections into Mongolia. North of the Tien Shan is a relatively low territory, Dzungaria, and similar Chuguchak, which extends to the Altai Mountains.

Eastern Turkestan, Kashgaria, is essentially the Tarim Basin and its margins. The floor of the basin varies from about 2,500 to 5,000 feet above sea level. It is enclosed on all but the eastern side. Summit elevations along the Altyn Tagh, to the south, are on the order of 20,000 feet. Mustagh Ata, in eastern-Pamir territory, rises to 24,357 feet. Tengri Khan is almost as high, in the Tien Shan, to the north.

Earthquakes are common along the Tien Shan. All central Asiatic mountains are young from the standpoint of geologic activity. Many contain extremely old rocks, but they are being elevated, faulted, and folded today at a rate which may be as rapid as that during any part of their history. The eastern tips of the Tien Shan rise to elevations in excess of 13,000 feet, whereas nearby Turfan Depression is actually below sea level by an amount which seems to be in dispute, but generally considered to be several hundred feet. This extreme local relief, as well as the high elevations of the mountains around Tarim generally, is certain evidence of active mountain growth. The basin has no outlet. As a relatively depressed region, it has been the site where deposits resulting from erosion and degradation of surrounding uplands have been collecting for many hundreds of thousands of years. Every earthquake means a little (from a fraction of an inch to several feet) increase in local relief, and therefore, potentially, a slight increase in rock available for conversion into basin-filling debris.

The Takla Makan, desert heart of Tarim, is among the drier areas of the entire world. Much of it is erg, a broad sand sea, without rural population and almost routeless. Between this sandy desert and the mountain flanks is a fairly broad belt of reg, locally *sai*, where grazing possibilities exist and where routes are concentrated. The

broadest reg lies to the north, at the foot of the Tien Shan. Through the reg and across occasional patches of erg run caravan trails marked by monuments: cairns, and ancient watch towers. These have been used since the beginnings of written history. There is relatively little pastoral nomadism in the region today. Most of the pastoral nomads, possibly 500,000 in all of Sinkiang, are in the mountains and Dzungaria. Most nomads along Tarim routes are predatory pillagers and robbers. Many are Tungusic-speaking Mongoloids. Turkic-speakers are the merchants, traders, and oasis inhabitants. To the east, Chinese are agriculturalists and merchants.

The climate is so arid in the Takla Makan that annual precipitation probably averages less than one inch. On the surrounding reg it is generally under five inches, but rises to twenty and more in the mountains. The average temperature in July is about 80° F. on the lowlands, many days are above 100°, and January is well below freezing, with temperatures below 0° occurring on many winter days. Daily ranges are extreme in summer, even more so than in the Sahara and other low-latitude deserts.

Habitable places are those supplied with water. Most of the population of Eastern Turkestan is concentrated where streams leave mountains, in strips trending downslope, at right angles to the

mountain base, or extending eastward along streams that bend and flow along the regional slope.

The Tarim River is the dominant stream of its basin. Most of its flow comes from western mountains. It follows an eastward course along the northern side of Takla Makan to Lop Nor, a lake lying mainly east of 90° E. and north of 40° N. Most of the oases and cities of Tarim Basin lie on tributaries, either actual or potential, of the Tarim. A considerable number of people make their living fishing, a Dry World anomaly, in this river. The river is lowest in late summer and rises rather suddenly to maximum stage in late fall. Melting snow, glacial meltwater, and summer rains in distant highlands feed it. It is well after summer before the full effect of these contributions is felt on the basin floor. While the river is running at relatively high stage, cold weather sets in and the top freezes over. Water continues to flow under the ice, but as the stage drops the ice cover collapses irregularly, forming an interesting jumble of tilted cakes.

The history of Tarim River is extremely interesting and informative in regard to settlement patterns. Until A.D. 330 the river approximated the course it follows today. At that date it suffered a major *diversion* in the territory south of Korla (Kuerblei), abandoning an eastward course to Lop Nor in favor of a southeastward course along the meridian of 88° E., through Tikenlik,



Outer China: index map

Jangi-su, and Arghan, toward the Cherchen Darya and the terminal basin of Kara-koschun to the southwest of Lop Nor. The old course below the diversion point was deprived of its flow; Kum Darya (sand river) became Kuruk Darya (dry river). The Old Silk Road between China and the west, which followed the Tarim, had to be abandoned. Old watch towers along the road fell into decay. The important city of Lou-lan, near the northeast corner of Lop Nor, was deserted.

In 1921 the Tarim suffered another diversion, leaving the course adopted in 330 for the channel occupied prior to that date. Kuruk Darya again became Kum Darya. Half the population immediately left the oasis of Tikenlik and people fled from the abandoned channel downstream. The impressive ruins of Lou-lan again look down upon a steady flow of water into Lop Nor, where the dry, salt-encrusted lake bed soon was covered by a sheet of water that expanded into a lake nearly sixty miles long and in places more than half that wide.

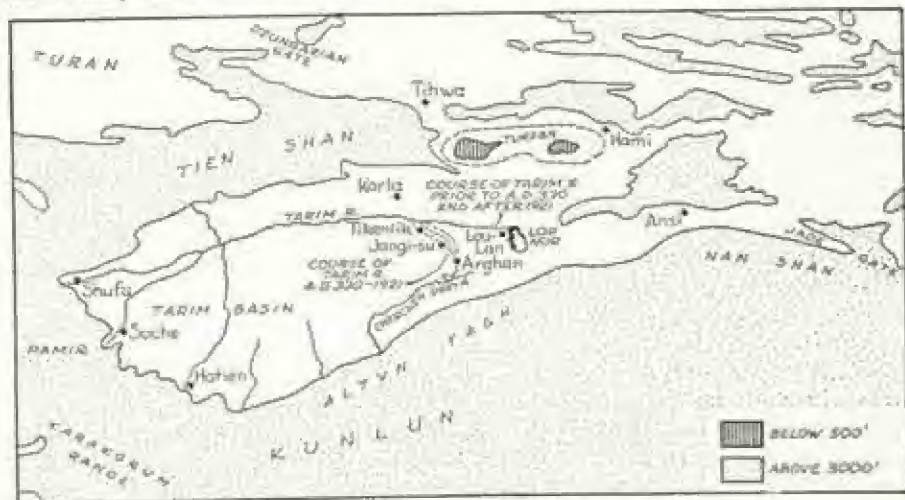
The history of Tarim River is instructive for several reasons. From the physical standpoint, it illustrates the proposition that conditions toward the mouth of a river depend upon factors far upstream, in territory ordinarily unaffected by events near the mouth. When the Mississippi, Hwang Ho, or other great river, shifts its course from a channel leading to some particular delta to an entirely new route, that event is determined upstream somewhere, possibly by some trivial condition. The place where the changes occurred that shifted Tarim River flow away from, then about sixteen centuries later back into, the channel leading to Lop Nor, lies about 150 miles upstream from the lake, and considerably higher, because the Tarim has a fairly active flow. The

diversions were directly the result of local channel clogging, caused by excess sediment.

Displacement of desert and steppe populations arises from many causes. In the case of people along the Tarim River, two catastrophic displacements have occurred since the year 330, below the diversion point. Most explorers who encountered the ruins along the old route past Lou-lan failed to interpret them correctly. Realizing that prior to 1921 there was not water enough to support the populations indicated by ruins, most suggestions as to the cause of abandonment predicated climatic change. It was argued that in earlier times the region had received ample precipitation, but that desiccation had set in and become so intense that people had to leave. Failure of water supply was indeed the cause, but not for the reason of climatic change. Diversion of the Tarim was to blame.

In spite of widespread belief in climatic changes it is improbable that any have occurred with sufficient magnitude to drive people out of lands that are now desert or dry steppe within historic times, or for several thousands of years before. It has been demonstrated adequately that even the effect of such a climatic upset as the glacial stages of the Ice Age resulted only in a very minor increase in Saharan precipitation, enough to send wadies far down courses from several highlands where the precipitation was most augmented. The Libyan Desert failed to witness appreciable change.

In marginal steppe areas, where grazing is good at times and fails at others, or where crops grow in years of unusually heavy precipitation, there is an endless record of alternating use and disuse by man. Some of the most striking exam-



Tarim Basin

ples have occurred in the Great Plains of the United States, where people have prospered on such crops as wheat during some years, only to become destitute later on as a result of several crop failures in succession.

It is generally true that signs of habitation remain long after people leave a country. If, in the case of a marginal steppe, people become fairly numerous during some decade when precipitation is above normal and many crops are matured, they will build houses and other structures, roads, fences, etc., which may be abandoned entirely after three or four years of crop failure. If, some years later, a new period of increased precipitation again attracts people to the region, there will be another period of house building and similar activities. If one views such territory after it has experienced several alternations between habitation and desertion, the evidence of all buildings that remain may suggest a population several times greater than any actually present at any given date. In the United States we would not likely make this error, because house styles change, our history has been short, and the individual waves of occupancy can be differentiated. In regions that have been settled for many tens of centuries there is always a greater tendency to overestimate populations based on such evidence as ruins. This has been the case in Tarim, and in several other parts of Eurasia.

The appearance of central Asiatic languages in Europe, the migrations that brought roundheads westward, and the arrivals of Tatars and other Mongoloids are events that seem to correlate with such things as the ruins of Lou-lan, or the abandoned watch towers along old caravan trails. To connect the two and then assume a climatic change as the cause of westward migration is a popular but extremely hazardous idea. The more we learn about such events the greater the importance of strictly psychological choices appears as a motive for migrations. A few people inspired by the teachings of the Great Prophet passed their inspiration on to others, with the result that Arabs crossed the Pyrenees not many years later. A successful warrior may readily build a following that sweeps and plunders widely. Population pressure may result from adoption of some new moral code. Physical events, such as diversion of Tarim River, bring abrupt changes locally, but people displaced from one downstream course are more likely to perish, or to find homes along the new waterway, than to sweep across thousands of miles in search of a

place to live. It apparently takes climatic change on the order of a major advance or retreat of continental ice caps to displace many people for considerable distances. It has been several tens of thousands of years since such an event has occurred and the changes it wrought undoubtedly went on very slowly. No historic migration has the slightest relationship to these major climatic changes.

Displacement of vegetation has taken place rapidly along the new course of Tarim River. Tamarisks, poplars, reeds, and grasses that require abundant water spread downstream in a very few years. Those along the abandoned course perished as suddenly. Fish, shore birds, and other animals soon made the readjustment, or died. The spread of population has been slower, in spite of the superior mobility of man. Projects to revive the Old Silk Road route have been formulated, but World War II and other events have retarded their realization. It is likely that the new course of the Tarim will not only locate new roads through Eastern Turkestan, but also permit a rather large population to accumulate along the rejuvenated oasis. There may be a revival of ancient Lou-lan, or several equivalents, provided with filling stations, radio communication, and other modern improvements.

Tarim Basin is provided with several important roads and routes. Transportation is not particularly difficult across the reg on either side of the Takla Makan. Most of the old caravan trails are suitable for trucks and automobiles and several important roads have been put into a state of fair repair. Ansi is an important junction point on the road leading from Ianchow, in northwest China. To the north is the main route through Hami. This leads west from Hami, through Turfan, along the southern side of the Tien Shan, through Kuche (Kocha), to Shufu (Kashgar), from whence numerous trails lead westward. The main route passes through 12,700-foot Terek Pass to Osh, in Fergana, or the various places accessible from there. Routes east from Hami lead along the Altai to Mongolia. The most important road of all, which became "China's Back Door," after the Burma Road was closed during World War II, leads north to Chensi (Barköl) and from there west to Tihwa (Urumchi), from whence there are three main ways to reach the Soviet Union through the Dzungarian steppe. One crosses into the Ili Valley to Alma Ata; a second runs west through the Dzungarian Gate; and the third turns north at Wusu (Ussu, Kweitun) to Chuguchak (Taheheng), reaching the railroad at Sergiopol. Along the latter route came many supplies to China during World War II.

Hami is also served by a road that turns west through Pichan and Turfan, where branches lead to either Tihwa or Kuche. Korla (Kurla, Kuerhlei) is an important road junction on the main Turfan-Kuche road, a route from there running south to Charkhlik, which is on the main southern Tarim road from Ansi west, through Cherchen, Hotien (Khotan), Soche (Yarkand), to Shufu. From Soche, a caravan route leads across Karakorum Pass to Leh, where branches turn either eastward into Tibet, or westward down the Indus Valley, to India.

From the standpoint of migrations and westward movements of Mongolian armies, the important gate to the west was along the good grazing lands of Dzungaria, past Lake Balkhash. From the standpoint of ancient trade between China and western lands the more important route was the Old Silk Road, which left the Jade Gate, near the western end of the Great Wall in the vicinity Suchow, and proceeded through Ansi. Prior to A.D. 330 it went around the northern side of Lop Nor, through Lou-lan, and west through Kuchi to Shufu. Ancients, such as Marinus of Tyre and Ptolemy of Alexandria, knew of Lop Nor because many travelers had seen it. After the shift in the Tarim River, the route of the Old Silk Road was no longer useful. By the time Marco Polo made his journey eastward, some eleven centuries after the time of Ptolemy, the Desert of Lop lay well to the north of his route and he made no mention of Lop Nor. Marco Polo's route, the main line of travel between western lands and China, was from Terek Pass to Shufu, then east via Soche and the southern edge of the Tarim Basin to Ansi. Trade along this route ended in about 1400 when the Ottoman Turks to the west cut it off. It was most prosperous during the days of the Khans.

The political hold of the Chinese on Eastern Turkestan has never been strong. Under the Han Dynasty, China held it between 101 and 26 A.D., then from A.D. 72 to 92. Various Turki peoples alternated control with Chinese, most notable among whom were the Uigurs who extended their power over Mongolia during the eighth to twelfth centuries. Then came Mongol supremacy and, finally, Chinese again. During the last 20 centuries, the Chinese have administered Shufu a total of slightly more than 20 per cent of the time, in general during times when strong dynasties ruled China and trade flourished. The present Chinese claim arose during the Manchu Dynasty. In 1878, the status of Tarim was raised from territory to dominion. The term Sinkiang means "new dominion."

Soviet influence has been strong in Sinkiang.

It requires approximately ten times as much time to reach the head of the railroad at Kalgan Pass, leading to Peiping, as to reach a Soviet line across Terek Pass, from Shufu. Dzungarian routes open westward as in past times, but the direction of political influence is now eastward. Tihwa, administrative center of Sinkiang, is much closer to Soviet lines of communication than to Chinese. For several years there was strict Soviet control of the whole region, followed by a rather sudden and somewhat dramatic return to a very weak China. A period of transportation, educational, industrial, and commercial advancement was begun during Soviet control and is in progress today. Sinkiang is likely to become part of the Soviet Union at any time.

The predominant religion is Mohammedanism, which was introduced in the fourteenth century. To the east are many Buddhists and Taoists. In the vicinity of Ansi are many grottoes containing tremendous numbers of Buddhist images. Taoism is not regarded as a religion, but as a philosophy which may be followed by Buddhists or others. Taoist monks and priests are in charge of many Buddhist shrines.

Turkic-speaking peoples predominate. In the high Tien Shan and other remote places there are Kirghizic and various Mongoloid nomads. Chinese have migrated into Eastern Turkestan at various times, particularly within recent years, but do not constitute over 10 per cent of the population.

The population of Tarim Basin is almost wholly confined to a few major oases. Shufu (Kashgar), 80,000, is the nodal route town of the west and commercial center, with oriental bazaars displaying many imports from the Soviet Union; wares from both India and China; and goods of local origin, most of which are textiles, of cotton, silk, and wool. As in the case of other centers, the oasis crops include wheat, millet, sorghum, rice, beans, cotton, tobacco, a variety of vegetables, and many deciduous fruits. About 1,000 square miles are under irrigation. Soche (Yarkand), 60,000, is the main political center of Tarim, and is commercially important for trade with India. Somewhat over 800 square miles are under irrigation in its vicinity. Hotien (Khotan), the chief town of an oasis with a population of 220,000, is the probable source for much Chinese jade. There is a great deal of mystery about jade. It is closely related to many kinds of common rock, but no European has ever found a place where it is mined. It has been filtering into China for many centuries, along the Old Silk Road.

Marco Polo mentions seeing jade at Pein, near Hotien. A number of families in southwestern Tarim are supposed to owe their immense wealth to possession of sources of jade, possibly somewhere in the remote Kunlun.

Ansi is a well-watered oasis on Sulu Ho, to the west of Tarim Basin. It is the home of some 500 families. Tunhwang, a few miles along the Old Silk Road to the west, is said to have 3,500 families. There are many Chinese in these and other oases to the east, toward Suchow. Practically all agriculture is in their hands. Turki peoples are present as merchants. The surrounding territory is mainly steppe, with comparatively good grazing for camels. Various Mongoloid nomads are concerned with plunder and a lively smuggling trade with northwestern China. A great deal of opium reaches China across this eastern part of Turkestan.

Hami (Qomul) and the string of oases westward along the southern side of the Tien Shan have a less adequate water supply than those along streams leading from the Karakorum and Pamirs. The Turfan group support a population of 20,000. Horses, camels, and sheep are grazed in mountains to the north and across the steppe of Dzungaria.

Tihwa (Urumchi), 60,000, is the capital of Sinkiang. It has long been important as a route center and market for hides and furs. Population is far less concentrated in Dzungaria than in Tarim because more-adequate pasturage permits extensive pastoral nomadism.

The main foreign impacts of recent years have come from the Soviet side of Eastern Turkestan. Practically all Europeanization is similar to that going on in Turan. The discovery of petroleum along the sides of the Tien Shan, at Wusu and other points, as well as along the margin of the Altyn Tagh, has not produced any great changes as yet, for the production is negligible. In the future this resource will undoubtedly become extremely valuable. Considerable modernization of towns and routes has occurred within recent years. Landing fields first appeared during Soviet control. Industry remains in a rather primitive condition, in spite of resources sufficient to support a number of important manufacturing centers.

MONGOLIA

Mongolia lies between Sinkiang and Manchuria, China and Siberia. Political lines coincide somewhat roughly with its natural boundaries.

The Great Kinghan is a satisfactory eastern limit for Mongolia and the Dry World. The Yablonovi, Buryat, Sayanski, and Altai roughly mark the transition between Mongolian and Siberian native tribes. The Nan Shan is a rather definite boundary toward Tibet. The Chinese long ago expressed their idea of where Mongolia began by building a Great Wall, to keep back invasions of "foreign devils." Only one Chinese word is needed to cover both concepts. The practically uninhabited western Gobi is a broad transitional belt toward Sinkiang.

Traditionally, Mongolia has two divisions: Inner Mongolia, the more habitable and more Chinese, lies just outside the Great Wall; Outer Mongolia, a much larger, more barren, and more strictly nomadic, mainly non-Chinese region, extends beyond, toward Siberia. Outer Mongolia is now an independent republic within the Soviet sphere of influence. Its 580,000 square miles support a population density under 4 per square mile, a low value for the Dry World. Inner Mongolia is part of China. Its 326,000 square miles support a population density of over 15 per square mile, which is about the average in better Dry World territory. The two Mongolias form almost a quarter of "Greater China," in the most expanded sense of the concept, but contain only about one eightieth of its population, if the most liberal estimates of Mongolian population are granted.

Aside from the Altai and mountains in the northwest, most of Mongolia is plateau between 3,000 and 4,000 feet in elevation. Most of it is reg, a concept similar to the Mongolian term, *gobi*. The Gobi Desert, or Shamo, covers about two thirds of Mongolia. Most of it is useful grazing territory, by Dry World standards. Precipitation is generally under 10 inches, but the latitude is equivalent to that between northern Colorado and southern Saskatchewan; soil moisture is preserved by long periods of winter freeze and low evaporation rates. Coniferous trees appear in uplands. Ulan-Bator-Khoto (Urga), the capital of the Mongolian Republic, has an average annual precipitation of 8 inches, an average January temperature of -10° F., with many drops to such levels as -40° , an average July of over 60° , with many days in excess of 90° .

Agriculture is possible in the extreme south and north. Most of Mongolia is a region of pastoral nomadism, with camels, sheep, horses, and cattle as principal animals. Sheep provide felt for yurts, skin and wool for clothing, meat, milk, and cheese. The other animals are used for transport, milk, and butter. As in most Dry World territory, the dung of animals is carefully col-

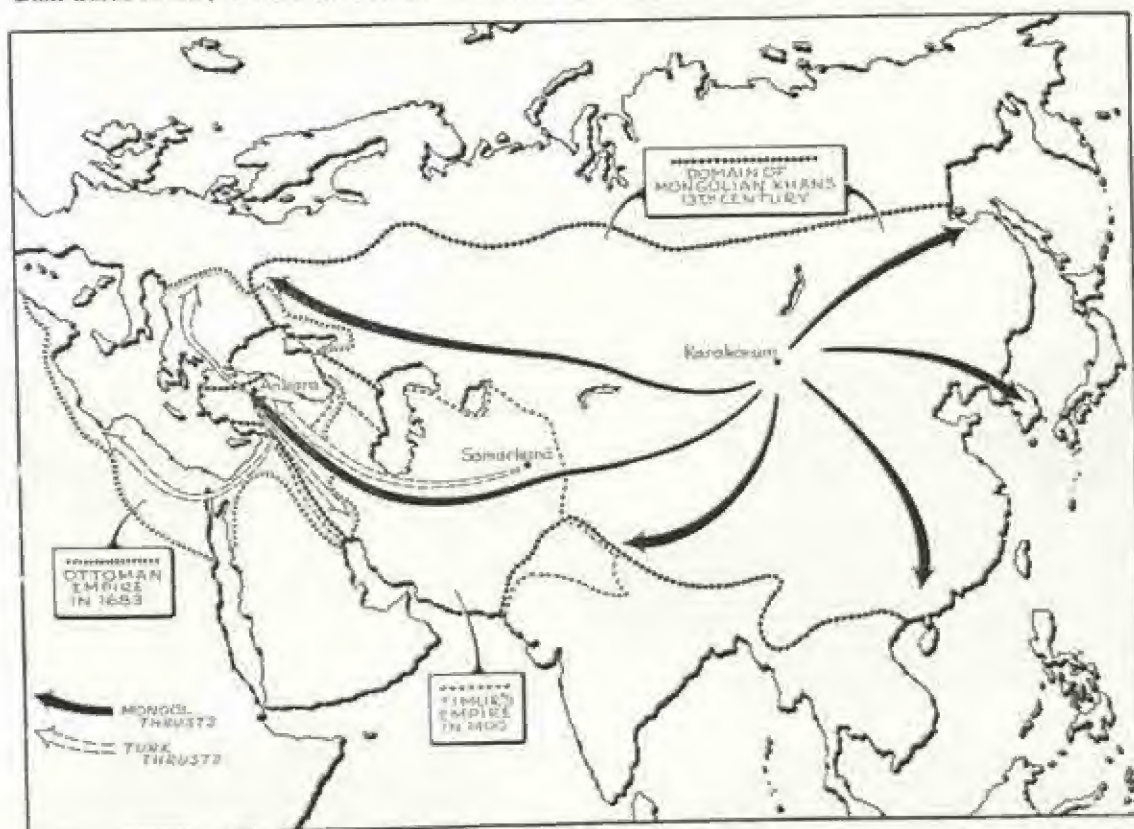
lected and dried, for fuel. It is also useful as a binder in making crude bricks for houses and animal shelters.

The principal routes across Mongolia lead from Kalgan, the important pass above Peiping. One follows the Great Wall westward, but around the great northern loop of the Hwang Ho, to the Silk Road and other routes of Sinkiang. The main road leads northwestward to Ulan-Bator-Khoto and the Soviet railroad terminus of Ust Kyakhta, south of Lake Baikal. A branch at Sairusu leads to the northwest, north of the Altai, while another route, farther south, connects with Sinkiang roads to Hami and Tihwa.

Mongolia was a remote land of obscure tribes, quite similar to those of Siberia, until the early part of the twelfth century, when Genghiz Khan started campaigns that resulted in establishing the most extensive empire the world has ever known. Neither the British nor Soviet Union have equalled the extent of holdings that came under the domain of the Mongolian Khans. For some two centuries and under five rulers this became the most advanced, tolerant, and learned realm of its time. Karakorum, to the west of Ulan-Bator-Khoto, served as one of the most

powerful capitals the world has known. To it went scholars, missionaries, scientists, artists, and leaders of all kinds from various parts of Eurasia. Emperors were enthroned in the presence of as many as 4,000 envoys from outside nations, mainly in Asia. John de Piano de Caprini witnessed such a ceremony in the Yellow Pavilion at Syra Orda, near Karakorum, in 1246. Returning to Lyon in 1247, he reported to the Pope such things as yurts near the Volga, the use of dung for fires, rainless winters, high winds, and dust storms of central Asia. William of Rubruck, another early traveler, also saw Karakorum where he found Nestorian Christians at Court; met Cosmas, a Russian silversmith, who had made the Emperor's throne; and was first to report to Europe, since the days of the Ancients, that silk came from China.

Marco Polo, who set out in 1271, is the European who succeeded in awakening western interests in the Far East and therefore ranks among the foremost in bringing on the Voyages of Discovery. His many experiences, gained during long residence, were fortunately preserved in written



Domain of the Khans

form, so that they could be read widely. The Polos went to Bukhara, Shufu, Soche, Hotien, and eastward, meeting Kublai Khan, who expressed his admiration for Marco in many ways. Among other honors he was the only European to become a Chinese Mandarin. Europeans traveled widely in Mongolia and Asia as long as the Khans ruled. In 1350, Pegolotti and Pagnini published a travel guide for Mongolia.

The Khan Empire collapsed, much as the Roman Empire had done about a millenium earlier. Kublai Khan established the Mongol Dynasty in China. Timur (Tamerlane) became the great ruler of the west, but his domain fell into the hands of the destructive Ottoman Turks shortly after 1400, and European contacts with Asia by overland routes were ended. The Mongol (Ming) Dynasty in China lasted until 1644, but it brought prosperity only to Far Eastern parts of the former Khan territory.

Most of the population of Mongolia consists of Neosiaties, who are closely related to such peoples as the Chinese, Koreans, and Manchurians. There are remnant strains of somewhat longer-headed Paleosiaties. The greatest change in recent times has been a heavy migration of Chinese to territory along the Great Wall. Probably over half of the population is strictly Chinese at present.

The Mongolians are mainly Buddhist Lamaists.

Each family is supposed to contribute one son to the priesthood. In many large areas the priest-monk population has exceeded half of the entire population, a ratio made possible by neglect or actual killing of baby girls. Monks are concentrated in large monasteries, which formerly constituted the only schools and carried on other useful activities. Taboos against disturbing the soil in any way kept Mongolians from agriculture, even in the few places where it might have been carried on, prevented development of mines, and prohibited burial of the dead. The practice of putting corpses out where vultures could devour them resulted in the development of vicious wild dogs, who are unwelcome visitors at camps along trails.

Like other parts of Outer China, Mongolia was tied to the Republic by an extremely weak thread after the Revolution of 1911-1912. Outer Mongolia has not really been part of China since World War I. As an independent "People's" republic, it is under Soviet influence to such a degree that it is practically part of the Union. The Russians, however, claim that it is under Chinese sovereignty. In 1945, the population voted (with zero votes cast for the opposition) for complete severance of ties with China.

Ulan-Bator-Khoto (Urga), 100,000, is capital and religious center of Outer Mongolia. Commercially it was once important as a caravan center, particularly for Chinese tea en route to Russia, a trade that now goes mainly by boat to



Mongolian settlement (American Geographical Society)

eastern termini of the trans-Siberian railroad. The city is now concerned with export of pastoral products to China and the Soviet Union. Altanbulak, 20,000, lies on the Mongolian side of Soviet Ust Kayakhta, thriving commercial centers for Mongolian exports, 170 miles from Ulan-Bator-Khoto. Not many years ago the 675-mile journey from the capital to Kalgan required some forty-five days of travel by camel. It is now accomplished over an automobile road in three days.

There is considerable contrast between the populations of the two Mongolias. It is estimated that not over 10 per cent of the people of the Mongolian Republic are either Chinese or Russian. Inner Mongolia is predominantly Chinese. The milk, butter, cheese, and mutton diet of the Mongolian nomad contrasts with the more largely vegetable diet toward the Great Wall. Barley, millet, and various vegetables are important crops in the three Chinese provinces, Chahar, Suiyuan, and Ninhsia, although each extends well out into poorly watered reg. During the summer enough rain falls to support a population which lives according to *Oriental World*, rather than *Dry World*, ways of life.

TIBET

Though modern political lines divide it so as to assign a large territory to Sinkiang and parcel the remainder between Tibet and China, traditional Tibet is the great highland region between the Himalaya and the Altyn Tagh. To the northeast it extends to the Nan Shan. A broad, high, and extremely rough belt to the east is transitional into typical China.

About three quarters of Tibet is above 10,000 feet in elevation. A large part is too high for nomads, with ground frozen for two thirds of the year and boggy during the season of thaw, or else stony and barren, where little or no vegetation exists for grazing. Some fifty mountains, in the Himalaya and Karakorum, rise to more than 25,000 feet, Mt. Everest to 29,141. Many summits in the Altyn Tagh exceed 17,000 and in Kunlun, 20,000 feet.

The climate is extreme from the standpoint of both seasonal and daily temperature ranges. Though in places the mercury may climb to 90° F., it may drop to 10° before morning of the next day. Severe winds at times move air as cold as -40° F. Lhasa experiences frost an average of 225 days per year. Precipitation is inadequate to provide exterior drainage over much of the plateau and many of the high lakes in terminal basins are saline. Yet there is snow enough to close practically all the higher passes in winter and

a good many are blocked during much of the summer. Glaciers up to 40 miles in length descend from valleys of the Karakorum.

The rainiest places on earth lie in northeastern India, south of the Himalaya. Steady monsoon winds bring in enormous quantities of moisture from the Indian Ocean, which is condensed and precipitated as they travel upslope. The zone of maximum precipitation extends on up to about 6,000 feet, above which the quantity of moisture still remaining in the air is greatly reduced. In spite of moisture losses occurring when air is forced as far up as southeastern Tibet, the very steadiness of the winds and the vast quantities of water vapor contained originally provide enough to furnish Sikang Province and southern Tsinghai with a surplus for run-off. Here, in eastern Tibet, rise the main rivers from Brahmaputra tributaries, which discharge into the Bay of Bengal, to the Hwang Ho, which discharges into the Yellow Sea. Within 100 miles of Batang one may cross tributaries of the Brahmaputra, Salween, Mekong, and Yangtze Kiang. About 200 miles to the north is part of the upper Hwang drainage basin. Forests floor the valleys of these streams.

Though Lhasa is closer to the Equator than Cairo, Egypt, or New Orleans, which means that differences in hours of possible sunshine are not greatly contrasted between winter and summer seasons, the climate is too severe for agriculture in most parts of Tibet. The growing season is no longer than from April to September. Most agriculture is carried on in the valleys to the south, along the Tsang Po (Upper Brahmaputra) and its tributaries. Barley and hay are raised up to an elevation of 15,000 feet. Barley and peas are the main food crops. From the former is made chang, the national drink, and tsamba, the national dish, consisting mainly of parched grain. Some wheat, fruit, and vegetables are raised in lower and better locations. The chief wealth of Tibet, however, lies in animals, goats, sheep, horses, asses, and yaks.

The yak is a relative of the bison and other bovines. It is particularly agile and able to withstand extreme cold, qualities that render it ideal as a draft animal for the high plateaus and mountains. The body is covered with short hair, from which cloth is made. The sides of the body and upper limbs bear a long, silky hair that can be woven into rope or tent coverings. The tails also have long hair, which makes them much prized in Oriental lands, for fly whisks. In China they are mounted like flags on poles, to serve as stream-

ers. Yak milk is particularly rich and yields a butter which is a staple of Tibetan diet, among other things being an essential ingredient of tea. Sod houses are bound together by yak dung. Yak chips in charcoal burners furnish heat.

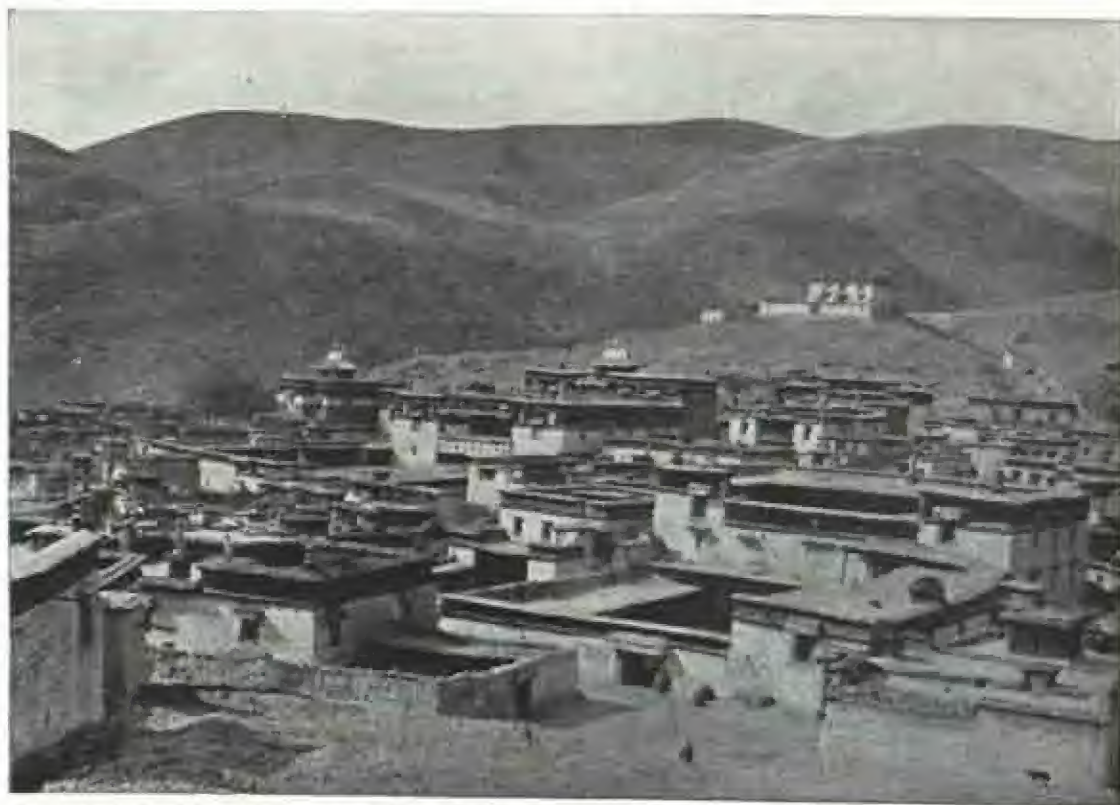
Tibetans are particularly fond of horses. One of the national sports is racing riderless horses. Camels are used over trails in the northeast. Goats and even sheep are made to serve as pack animals in remote lands of the west.

Big-horn sheep, blue sheep (Bharal), various deer, including the valuable musk-deer, gazelles, wild asses, wild yak, bear, and various other large animals tempt the big-game hunter, but the Dalai-Lama frowns upon such activities and Tibet is officially a land where hunting for sport does not exist. Hides of domestic and of smaller wild animals, especially marmot (groundhog) skins, are important animal products.

Tibet was conquered by the Chinese in A.D. 650. Genghiz Khan brought it into the Mongolian Empire in 1209. Kublai Khan, after inviting representatives from various religions to his court and making a study of each, decided in favor

of Lamaism, to which he became converted in 1270, later setting up a rule by Lamas, or priest-kings. Though the Chinese have long claimed Tibet, it has in reality been governed by its Lamas. All vestiges of Chinese control ended during the Revolution, the Chinese being expelled from Lhasa in 1911. Since then the British have gained considerable influence. The main tie to the outer world has been the British telegraph line from India to Lhasa. British officers have trained Tibetan troops and advised local rulers. Soviet interest has become intensified recently, not because Tibet is populous or prosperous but because it wields an important religious influence over many millions of Asiatics.

In 1928, Tibet was politically divided into two main parts. Farther Tibet was recognized as independent from China, with its theocratic rule centered in Lhasa, in the person of the Dalai-Lama, though the Panchan-Lama, at Tashlumpo, in Shigatse, somewhat to the west, is the actual spiritual head of Lamaism. Nearer Tibet is organized politically into two provinces of China, Tsinghai (Chinghai), a huge, barren territory to the northeast, and Sikang, the rough terrain of the southeast. Farther Tibet lost its independence in 1951.



Tibet: lamasary (American Geographical Society)

The choice of Kublai Khan in establishing Lamaism, a peculiar form of Buddhism, as the basis for governing Tibet, is one that has resulted in seclusion unparalleled elsewhere. Since the visit of Friar Oderic of Pordenone, the first European to see Lhasa, during a trip to China, 1316-1330, comparatively little has happened in Tibet and very few Europeans have been permitted to travel there. It is estimated that 15 per cent of the population belongs to the priest-class. Every family must contribute at least one son, as in Mongolia.

The peoples of Tibet have not been available for much scientific study but it is known that there is considerable Paleosianic population, hardly distinguishable from some of the most remote Indian aborigines in South America, and also a dominant Neosianic group. Chinese population prevails in the southeast and is gaining in relative numbers everywhere in the Chinese Provinces.

The main social distinction in Farther Tibet is between Lama and lay people. The Lamas are priests, monks, educators, and in general the political class. At the base of the social scale is the Porus class—people who till the soil, butcher cattle, and take care of the dead. Cadavers are cut into pieces sufficiently small to be carried off by vultures, after being transported to hill tops or mountain peaks. There are many tribal distinctions among the nomads. Those most numerous are the Mongoloid Pachens. Ngoloks of the northeast are taller, more rugged, and fiercer in combat. The prevailing language is Indo-Chinese, though Chinese dialects are widespread in the east.

Transportation is almost entirely along trails. An anomaly is river-craft use for some 400 miles along the Tsang Po. Most trails are difficult, so that riders dismount frequently. Dangers from bandits exist practically everywhere, except along the main route between India and Lhasa, a road and trail that leads to Darjeeling, through Gyantse. Though the airline distance is but 250 miles, it takes over a week for mail to make the trip in good weather.

Lhasa, the one great city of Tibet, with a population of 50,000, would hardly be dignified by the term "town" in many lands. In Tibet, however, there are very few places with as many as 2,000 inhabitants. Lhasa is a sacred-political center containing the Potala, a building that caps the top of a hill, with an impressive façade 440 feet high and 900 long. Only superficially is this impressive structure a great building by western standards. Luxurious for Tibet, its quarters are plainly whitewashed. Within it dwells the Dalai

Lama. On its roof are the tombs of his predecessors, not far from his personal quarters. This building serves as capitol and somewhat as a Vatican for western Tibet. To it come pilgrims, many of whom lie prostrate, mark the position of finger tips, rise, lie prostrate again, one body length closer to their goal, traveling long distances like so many inch-worms. It is said that the last adult Dalai-Lama had a total of fifteen miles of roadway available for the use of his Rolls-Royce automobile, which had been brought over trails in small pieces.

As a commercial site, Lhasa commands the principal routes of Tibet. Near it is the one modern, steel bridge of the entire country. Elsewhere the trails cross rivers on precarious swinging bridges, on little ferries, wicker and hide coracles, or by fording. Gyantse, about 105 miles southwest of Lhasa, is the main center of trade with India, a fort, and British mail and trading post. Its population is about 13,000. To its northwest is Shigatse, with about the same population. Both of these places lie in fertile, irrigated agricultural districts. The main route west leads to Manasarovar Lake, a holy place to millions of people in India and Tibet. Lying between the sacred Himalayan mountains of Kailas and Gurlamandata, it is Siva's Paradise and Brahma's Heaven. This lake is not far north of the northwestern corner of Nepal, and is accessible by routes leading across half a dozen Himalayan passes in its vicinity, all of which are high and difficult. Beyond Lake Manasarovar, the route from Lhasa continues to Gartok, Leh, and Kashmir.

The most important route from Lhasa to China leads eastward through Chiamdo and Batang, to Tatsienlu, through the "Chinese Alps" of the upper Yangtse. Tea and cotton goods come to Tibet in exchange for gold, wool, hides, yak tails, musk (though the supply of musk-deer is now extremely low), and rhubarb. Tatsienlu is an outpost between culture worlds, where loads are transferred from backs of animals to those of coolies, or placed on wheelbarrows.

The route to Lanchow, in Kansu Province of northwestern China, is long and difficult though well-traveled. Caravans do well to make the trip from Lhasa in two months and commonly require more than twice that time. The trail is fairly well policed within the Dalai-Lama's territory, which ends at the summits of the Tugla Mountains. For about 200 miles beyond, to the vicinity of Yushu, not far west of the Yangtse Kiang (Dichu) crossing, there is practically no governmental con-

trol and caravans have difficulty in protecting themselves from pillagers and bandits. Chinese control becomes somewhat effective farther east, and is reasonably good in the vicinity of Koko Nor. An automobile road leads from Tangar to Lanchow. There are various routes still farther out into Tibet now and then taken by automobiles, but they are not maintained sufficiently well for regular traffic.

In extreme western Tibet is the route from Sinkiang to Leh, over the 18,270-foot Karakorum Pass, which lies beyond the political limits of the country within Kashmir Province of India.

Tibet is an enormous example of the negative character of mountainous and high plateau territory from the cultural standpoint. It is distinctly transitional between Dry and Oriental World cultures but on the whole belongs to the former, rather than the latter. The dominance of nomadism is a result not only of extensive areas with little precipitation but also of extreme height, which restricts vegetation to the limited growth of the tundra.

Though peoples of the Polar World are far away, they have much in common with many inhabitants of Tibet. Both face the problems of

protection against extreme cold and of using animals to graze lands with scanty vegetation. The place of the yak in nomadic Tibetan economy is very much like that of the reindeer in the Eurasian Realm of the Polar World. A wholly cultural matter, relative security of individual life and property, is the basis of a tremendous contrast between Polar and Dry World peoples. In the former culture peoples are extremely co-operative. In the Dry World, from the smugglers and thieves of Villa Cisneros, in Rio de Oro, to the opium smugglers of Mongolia, or the wild tribes of Tibet, the culture is one in which he who possesses the best arms and most alert sentries is most likely to be wealthiest and most powerful. It is clearly false to attribute these characteristics to such environmental factors as limited resources. Polar World peoples cheerfully make the best of what they have and it is ordinarily extremely meager. The contrast is not racial, since both Polar World and Turko-Mongolian Realm peoples are almost purely Mongoloid. Culture traits are acquired through association with fellow man. Tibet has contributed almost nothing to the world, but it has taken certain traits, such as language and religion, from the Oriental World and many of its ways of life from neighbors who inhabit the arid lands to its north.

AFRICAN WORLD

35: Natural Setting

The African World is the world of the Negro. It by no means includes all Africa, because Negro cultures are restricted to the portion of the continent not occupied by the Dry World. Arid North Africa and the Abyssinian Highlands are culturally part of the Dry World; the remainder, the southern two thirds of the continent, constitutes the African World.

The distinctive cultures of the African World did not develop in isolation. Old Stone Age cultures diffused freely through the continent. Ancient Egypt exerted influences on cultures to the south. Food crops, domesticated animals, and house types reveal many traits identical with those of southeastern Asia. Dry World contributions in the form of a grazing economy spread deeply into the continent. Arab influences have been so great in recent years as to detach the Eastern Sudan from the African World and make it part of the Dry World. And, in return, the African World has sent traits of its own invention to other culture worlds.

Whatever the borrowings, they have been thoroughly integrated into cultures that are distinctly African. For example, iron smelting and the working of brass and bronze are now generally considered to have originated elsewhere, but Africans adapted the idea of extracting and using metals to their own notions as to how it should be done.

African cultures are reckoned as primitive by European standards. Dominant are simple gathering and hunting peoples, pastoral nomads, and hoe agriculturists. Written languages failed to develop, and Negroes planned and constructed no great stone structures. Nevertheless, the cultures serve well the needs of their practitioners. Problems of subsistence find satisfactory solution, and such matters as social, political, and military organization, and economic and artistic development have reached levels higher than primitive. Most certainly cultural attainment is such as to demonstrate that the Negro is not handicapped by mental deficiency in the struggle for human accomplishment.

The New World Revolution reached Negro Africa when contacts were established with mod-

ern Europeans. Native cultures have crumbled before the technically superior equipment of the invaders. European colonization has been truly successful in one area, South Africa. There is no suggestion, however, that African peoples are to be replaced by other racial groups. Quite the contrary, for Africa is easily the most densely populated of areas considered to be prevailingly uncivilized. Whatever the future effects of the New World Revolution may be, the resulting cultures will be those of Negroid peoples.

PHYSICAL BACKGROUND

Africa's area of 11.5 million square miles gives it continental rank second to Asia's 16.5 million and ahead of North America's 9.4 million. There is no natural break between Africa and Eurasia. The artificial Suez Canal creates an actual separation between Africa and Asia, but tradition places the continental limit east of Sinai Peninsula. Otherwise the boundaries are easily distinguished: the nearly enclosed Red Sea, oceanic bodies, the narrow Strait of Gibraltar, and the Mediterranean.

In form Africa resembles a great figure-9. There is a great indentation of the west coast, the Gulf of Guinea, and directly opposite on the east coast is a projection, the Horn of Africa. Despite these two great natural features, the coastline is significantly regular. With an area three times that of Europe, Africa's 19,000-mile coastline is actually shorter than that of the smaller continent. There are no long indentations to carry either ships or climatic modifications inland. Furthermore, there is a shortage of harbors, a general absence of good fishing banks, and few islands. Of the last, Madagascar stands alone in size and importance.

Africa is the only continent set squarely astride the equator. To north and south the 5,000-mile over-all length is almost equally divided, since the two extremities rest approximately on the 35-degree parallels. The maximum east-west distance is somewhat less, about 4,500 miles. The meridian of 20° E. forms a fairly symmetrical north-south continental axis, while 50° E. and 15° W. are ap-

proximate longitudinal limits. The areal bulk and greatest breadth are north of the equator; four fifths of the continent lies between the two tropics.

Like Australia, Africa is a continent whose geologic history and surface configuration are both fairly simple and evident. Africa lacks great complicated mountain systems such as those bounding the Pacific. The major elements of the simple relief can be associated with a few main geological divisions.

Oldest and most widespread of the relief features are the plateaus. Formed of old (pre-Cambrian), eroded rocks, they are indicative of a long period of stability. Geologists who believe in the drift origin of continents see in Africa the old, solid, immovable mass from which South America, India, and Australia moved away. They point out that in all Africa there are but two series of folded mountains, the Atlas ranges of the Barbary region, structurally related to European mountains; and a minor range in South Africa. Similarities among the old-rock plateaus of Africa, southern Brazil, southern India, and Australia are accepted as evidence of common origin.

A second and later geologic time period is

represented by belts of sedimentary rocks found in the very narrow coast plain and occasionally in patches overlying the plateau. Both coastal and interior sedimentary deposits are indicative of invasion by the sea, deposition, then withdrawal of the marine waters.

A third set of relief features is composed of volcanic peaks and lava plateaus. Rather late in geologic time came eruptions that deposited great thicknesses of volcanic materials in eastern Africa and gave rise to the continent's two highest peaks, Kilimanjaro, 19,000 feet; and Kenya, 17,000 feet. About the same time there was volcanic activity a short distance inland from the apex of the Gulf of Guinea, resulting in 13,000-foot Cameroon Mountain.

Associated with the volcanic activity and occurring at the same time was faulting on a very grand scale. This faulting is responsible for a most remarkable and prominent relief feature known as the Great Rift Valley. Technically the Valley is a graben, a depressed block of the earth's crust bounded by faults. The graben is something like an enormous ditch, its straight-sided walls from 15 to 100 miles apart, and its bottom from a few hundred feet to nearly a mile deep.



Kilimanjaro (American Geographical Society)

To summarize, the major relief elements are the old plateaus, the younger plains, the volcanic peaks and flows, and the Great Rift Valley. The extent and relative positions of these elements need further description.

The old-rock plateaus are the dominant topographic features of Africa. They are spoken of in the plural since there are several distinct levels. Collectively the plateaus rise sharply above the lowland plains at an average distance of 20 miles inland from the coast. The southern part of the continent is the higher. Here the plateau levels average over 3,000 feet in elevation. The high plateaus reach northward roughly to 5° N., with a long prong extending along the eastern side of the continent to Abyssinia.

The surface of the high plateau is by no means a plane. It is hollowed by the basins of several rivers, the Zambezi, Orange, Congo, and Nile. The basin occupied by Lake Victoria is a crustal sag. The Great Rift Valley begins its course across the plateau near Beira, on the coast of Portuguese East Africa. It continues northward to include fiord-like Lake Nyasa. From Nyasa north the graben forks. The western branch is outlined by Lakes Tanganyika, Edward, and Albert. The less-continuous eastern branch includes the basin of Lake Rudolf, then extends northward to join the complicated pattern of fault features occupied by the Red Sea, Gulf of Aden, Dead Sea, and River Jordan.

The northeastern prong of the high plateau is capped by tabular masses of lava in East Africa and Abyssinia. Here Africa's highest points rise above the flows as volcanic peaks. Elsewhere in the eastern section of the continent the old rocks of the plateau are mantled by river sediments or wind-deposited sands. At still other places they have been long exposed to erosion. Some idea of the extent to which the old rocks have been removed by erosion is provided by 17,000-foot Mt. Ruwenzori, the remnant of an old, high plateau surface, lying west of Lake Victoria.

North of the Congo Basin and west of Abyssinia are the low plateaus of the Sahara, averaging about a thousand feet in elevation. Above them rise hard-rock remnants that form the Tibesti Mountains and Tassili Plateau, with considerable areas in excess of 9,000 feet high. Several tablelands of lower elevation, also of unfolded rocks, are the most prominent relief features of the Sudan. The general surface level of plateaus and tablelands is broken by a number of depressions, of which perhaps the most interesting is the undrained basin of shrinking, freshwater Lake Chad.

Coastal plains and alluvial lowlands are so

restricted in area as to be quite inconspicuous on an atlas map. Of exaggerated importance because they are few are the lowlands extending from the eastern end of the Atlas ranges to Egypt; the Senegal basin and a continuous narrow strip reaching along the Guinea coast to Angola; and another along the east coast, widest in Portuguese East Africa and Somaliland. Except for the Mediterranean and the Agulhas bank off the tip of South Africa, the shore line lies close to the edge of the continental shelf. For this reason the continent has few good fishing banks, few islands, and thousand-mile stretches of harborless coast.

Africa's drainage patterns are quite as complex as its form and structure are simple. There are seven major river systems: the Nile, discharging into the Mediterranean; the Senegal, Niger, Congo, and Orange, flowing into the Atlantic; and the Limpopo and Zambezi, entering the Indian Ocean. About a third of the total continental area has interior drainage, notably in the Sahara; the Lake Chad basin; the Lake Ngami basin of the arid portion of South Africa; and the part of the eastern branch of the Rift Valley tributary to Lake Rudolf.

Each of the major streams and many of the minor ones tumble off the edge of the plateau in waterfalls or rapids, the most scenic example being the famous Victoria Falls of the Zambezi. As a result these streams that reach the coast



Africa: relief

are swift in at least a part of their lower courses, and the abrupt breaks in gradient prevent through navigation. Another deterrent to navigation is the fact that only the Congo has a broad, open estuary; all the other major streams have mouths obstructed by deltas and bars. When to these conditions are added the thousand-mile-long sand bars found on both east and west coasts, the difficulties involved in landing from a ship and getting inland are obvious.

The Congo is navigable for 95 miles above its mouth. After the interruption of rapids and falls it is navigable for hundreds of miles in its upper course. The Niger has built the biggest delta on the continent, some 14,000 square miles, and is navigable only during the rainy season, from July to January. The Limpopo is navigable for thirty miles above its mouth, and the same is occasionally true of the Orange for small steamers. The Zambezi is blocked by a bar at its mouth, but is navigable by shallow-draft vessels for some 1,600 miles.

The rivers plunging over the plateau escarpments are given thereby a high degree of power to erode. This has frequently resulted in the working back of headwaters into drainage basins of slow-moving streams, which have been captured or diverted by the more-aggressive rivers. An excellent example of *stream piracy* is shown by the Niger. The Niger rises only 150 miles from the coast, then flows along a 2,600-mile semicircular course to enter the sea. The northward-flowing upper part of the system was once an independent stream that led to an interior lake. It was captured by what is now the lower course,

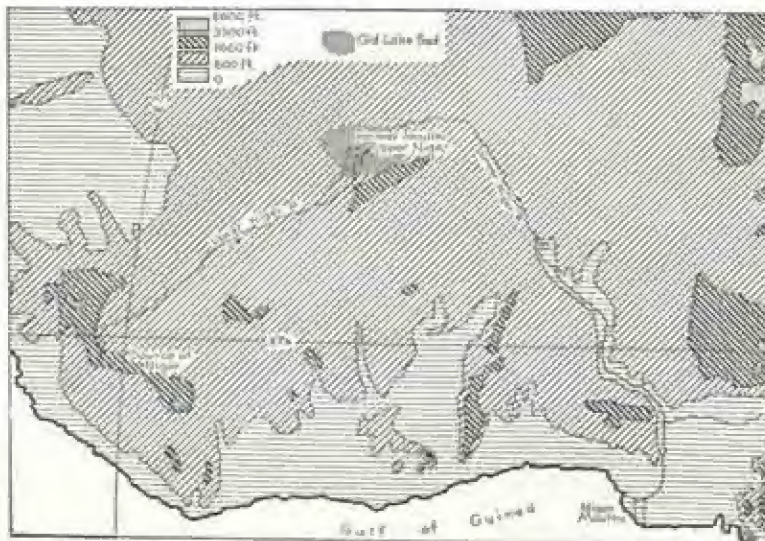
an energetic river that had cut its channel back from the coast. A case of incipient piracy is illustrated by the Shari and the Benue. The former rises about a thousand miles from the sea, then flows 700 miles to the Lake Chad basin, still a thousand miles from the sea. The Benue is the swift-flowing main tributary of the Niger, and is now about to take over the upper course of the Shari. There are other examples, involving not only the drainage systems of interior basins in northern and southern Africa, but also the loss of tributaries by the Congo itself.

The very rapids and waterfalls that have delayed the commercial penetration of Africa by obstructing through navigation, are at the same time of great possible benefit to man. Combined with other favorable factors they give Africa the greatest hydroelectric potential development of any continent. Particularly among member streams of the Congo system there is a desirable combination of heavy, regular volume of water, uninterrupted by cold winters. Similar conditions prevail in the Amazon region of South America, but the lower part of the Amazon lacks the steep gradients necessary to the development of power.

On a small-scale map the few lesser islands flanking the African coast disappear. Not so Madagascar, for this 228,000-square-mile, thousand-mile-long island is the world's fifth largest, coming after Greenland, New Guinea, Borneo, and Baffin Island.

Madagascar is described geologically as a *fault-block* structure, meaning that the island is a crustal block that has been uplifted and tilted. The eastern coast is remarkably straight; above it the island surface rises abruptly to the crest of a 9,500-foot-high range of mountains. West of the crest the land falls gently in a long slope to the irregular coast bordering Mozambique Channel. In the northern part of the island are a number of now-quiescent volcanoes. Hot springs and frequent earthquakes indicate that mountain-building forces are still active.

Madagascar is separated from continental Africa by



Niger River: stream piracy

the 320-mile width of Mozambique Channel. As a consequence of its isolation from a non-seafaring people, Madagascar is culturally closer to the Malaysian Realm of the Oriental World than to the world of Negro Africa. The tiny island of Zanzibar, within sight of the eastern continental coast, has played a far greater part in things African than has large Madagascar.

There is one other matter of great importance to man that is related to Africa's geologic history, and that is minerals. A varied geologic background makes for a diversified mineral supply. Africa's rather simple sequence of geologic events has limited the variety of its minerals. Coal and petroleum are associated with sedimentary rocks, the former with continental, the latter with marine sediments. Rocks of either type are not abundant in the African World. Coal is mined in South Africa, but the reserves are limited. Coal is reported for Rhodesia, Tanganyika, and Nigeria. Nevertheless, Africa ranks with South America as a coal-poor continent. For some years geologists and drillers have sought petroleum. As yet there are but few oil fields, and they all lie in the north, in Egypt and Barbary. Africa must be regarded as highly deficient in this important mineral fuel. Ancient rocks over much of the continent could not contain hydrocarbons.

On the other hand, the old rocks making up the plateaus that constitute most of the continent are outstanding in the world production of several minerals. Africa leads the continents in gold and diamond production by a wide margin. The Katanga copper deposits are among the world's best. There is important production of chromium, cobalt, graphite, and tin. Iron ores have been mined and used by Negroes for centuries. There appear to be excellent and extensive commercial iron-ore deposits, even by standards of modern industry. Perhaps because it is the most-prospected area, known mineral deposits of all kinds are concentrated in the southern part of the continent, from southern Belgian Congo southward through the Union of South Africa. Considerable mining activity occurs in northern, non-Negro Africa.

In concluding this section on the surface configuration of Africa, it might be well to summarize briefly the nature of that portion of the continent that is the land of the Negro. It is primarily the area of high plateau, with broad, flat surfaces standing in several levels, in some places dominated by towering peaks, in others hollowed by broad basins. To the narrow coast plain the plateau presents a cliff face over which drop the rivers on their way to the sea. Above the plateau walls was the extensive sanctuary that kept its

Negro inmates long secure from the encroachments of modern civilization.

CLIMATE AND VEGETATION

Africa conforms in the main to the generalized world pattern of climatic distributions, but as a continental section of the earth's surface it naturally possesses its own distinctive characteristics. First, Africa is the most tropical of all continents, since it is bisected by the equator and its extremities reach only the 35th parallels.

A second important point is the absence of high, long, continuous mountain barriers. Though the seaward-facing walls of the plateau force inward-moving air upward to increase precipitation locally, they do not prevent winds from reaching freely the interior of the continent. The reduction of temperature by elevation, despite the presence of permanently snow-capped peaks on the equator, is highly restricted for the continent as a whole. Only on the high edges of the plateau in South Africa and on the tabular lava masses of East Africa and Abyssinia is there appreciable cooling because of elevation. For most of Africa comparative human comfort is more closely related to humidity than to actual temperatures.

Coastal currents are a third significant point. Warm waters border the Indian Ocean and Mediterranean coasts. They encourage precipitation to some extent and may be seasonally responsible for warming the lands immediately adjacent to them. On the Atlantic side of the continent the situation is different. The Canaries current flows southward and cools the coast from Gibraltar to Cape Verde. The cold Benguela current flows northward and is effective from Capetown to the mouth of the Congo. The effects in both cases are to cool a coastal strip and, more important, to contribute to restricting precipitation, and thus bring severe desert conditions directly to the seashore.

The pattern of continental winds is complicated and it changes seasonally. During the midwinter month of the northern hemisphere (January) the center of attraction is Africa south of the equator. The Mediterranean coast is reached by northern cold air and gets from 2 to 8 inches of precipitation. Throughout most of the northern continental bulge the winds are northeasterly and extend centrally far south of the equator. The Horn and the eastern side of southern Africa are dominated by east winds. The western portion of southern Africa gets south to west winds. Dur-

ing January there is little or no rainfall between the parallel of 5° N. and the Mediterranean region. Little precipitation falls along the southwest coast. Maximum rainfall occurs in the southern-Congo and Zambezi basins and amounts to from 8 to 12 inches.

During July the wind equator extends east and west across the middle Sahara. To the north the dominant winds are northeasterly. South to the geographical equator they are generally southwesterly. Southeast winds dominate the remainder of southern Africa to the tip, where cold-air invasions from the south control winter weather. During this month the continent's rainfall is concentrated in a belt lying between the geographical equator and the parallel of 15° N. Maximum precipitation of over 16 inches comes in Liberia and Sierra Leone, the product of the so-called southwest monsoon. The Kenya coast and highland Abyssinia get moderate to heavy precipitation brought by another seasonal wind, the southeast monsoon, which blows in from the Indian Ocean. With the exception of eastern mountainous Mad-

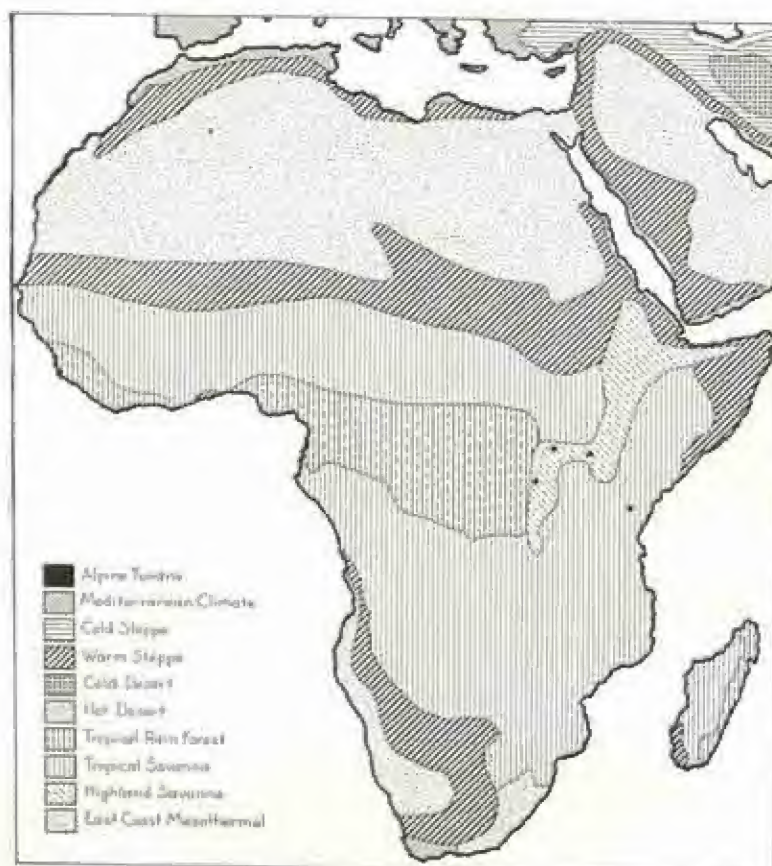
agascar and a thin coastal strip from Capetown east, Africa on both sides of the above-mentioned rainfall belt gets very little precipitation during July.

One may readily deduce from the two preceding paragraphs, which are descriptive of seasonal extremes, that little of Africa gets abundant precipitation well distributed through the year. The central Congo basin receives from 60 to 80 inches without marked dry season. A section of the Guinea coast including Cameroon Mountain gets over 80 inches well distributed, and eastern Madagascar falls in the same general category. The Liberia-Sierra Leone coast is one of the rainiest regions in Africa, but there is strong summer dominance. The same seasonal regime prevails in Abyssinia with total precipitation of from 40 to 80 inches. Exclusively winter rainfall is characteristic of only the Mediterranean region and a thin coastal strip of southernmost South Africa. Rainfall deficient at all seasons are the huge Sahara, the Horn, and a large section of southwestern Africa lying between Capetown and the mouth of the Congo.

The traditional concept of Africa as entirely

jungle and rain forest south of the Sahara is grossly wrong. The idea may have originated with early travellers whose notions of southern Africa were gained from the heavily forested Guinea coast. In any event, natural vegetation reflects closely the amount and distribution of precipitation. In view of this relationship it is not surprising to find that in Africa the natural plant cover is one quarter desert, one half shrub and grassland, and only one quarter woodland and forest. A part of the last category includes all the jungle and rain forest.

The distribution of the climates and vegetation zones of Africa is symmetrical on either side of the equator.



Climates of Africa

Their identity and sequence differ in no unexpected manner from the generalized world pattern. Tropical rain forest follows the equator from the Guinea coast to the plateaus of East Africa. It is adjoined on either side by tropical savanna, with areas of modified savanna west of Lake Victoria and in the Abyssinian highlands. Next, both north and south and extending inland from the Atlantic coast, are steppes and deserts. Bordering the arid areas both north and south are Mediterranean regions. The narrowing of South Africa crowds a subtropical or Carolina east-coast climate against the Mediterranean belt of the south coast. On the broad continental masses of the northern hemisphere the corresponding east-coast climate appears in China.

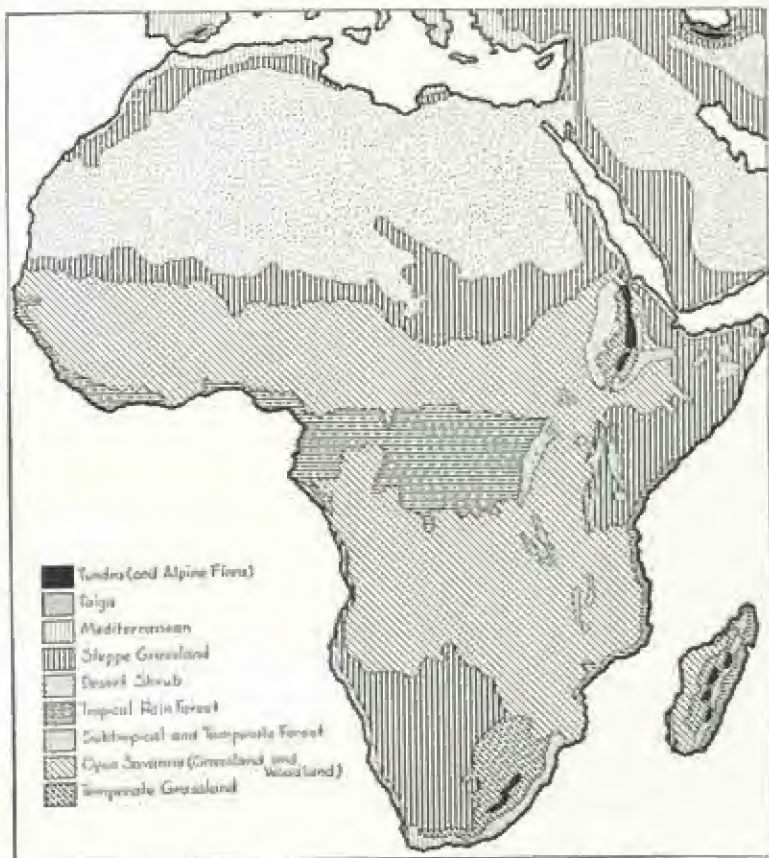
Tropical rain forest is both a climatic and a vegetational term. Climatically it refers to a winterless temperature regime, with no monthly average below 65° F., and rainfall so persistent or so abundant as to support a forest growth. The annual isohyet of 60 inches approximates the outer boundary of the rain forest. Temperatures are rarely if ever excessively high, nor is there a great daily or seasonal range. Temperatures normally hover monotonously in the neighborhood of 80° F. Humidity remains high most of the time. Abundant heat and moisture combine to affect plant growth in a manner similar to that produced in a greenhouse, so that the tropical rain forest is aptly referred to as a hothouse climate.

The tropical rain forest occupies the Congo basin from the coast to the highlands in a belt about ten degrees wide, extending symmetrically five degrees on either side of the equator. It includes the Cameroon coast and the mountain of the same name, whose western slopes receive precipitation of some 400 inches annually. An additional section of the Guinea coast reaches as far west as

well-watered Liberia. The intervening Gold Coast, however, has too little precipitation to qualify as rain forest. The eastern side of Madagascar is also included within the African rain forest, remote though it is from the major area of the climate.

The most conspicuous natural features of the rain-forest landscape are an intricate pattern of full-bodied streams and an obscuring growth of vegetation. High, steady precipitation necessitates numerous rivers to carry surplus runoff. Lack of sharply differentiated rainfall seasons results in rather constant high-water stages in streams, so that they always give the impression of filling their channels to the very edge of the bounding forest.

The characteristic tropical rain forest is broad leaved and evergreen. When the leaves are shed they are replaced immediately by new growth. Growth is continuous and active, instead of remaining quiescent for a period months in length. The forest is a stratification of many lesser and a few greater trees whose foliage coalesces into a green, wavy canopy through which sunlight



Vegetation of Africa

rarely penetrates. In the gloom of the forest floor there is little undergrowth, but there are innumerable vines wrapped around the trunks and hanging from the branches of the trees. Of the individual trees composing the African rain forest there are many whose common names are familiar: mahogany, tulip, ebony, and walnut. Others prominent in the heterogeneous assemblage are the silk-cotton tree, the oil palm, and various rubber-bearing plants. Along the wet tropical coasts, favoring deltas and other positions near discharging streams, is the peculiar growth known as mangrove. The mangrove grows in the water, its trunk supported by a dome-shaped framework of exposed roots that have a habit of reaching ever ahead in the water to build broad entanglements most difficult for man to penetrate.

Contrary to uninformed opinion, the rain forest is not the "big game" country of Africa or other tropical lands. The important gregarious mammals such as the various deer, antelope, and buffalo are grazing herbivores, and their natural habitat is the open grasslands. The gloomy, grassless rain forest teems with birds, reptiles, fish, and other forms of animal life whose needs it can supply. The African rain forest is the home of the python, cobra, and other poisonous and non-poisonous snakes. The still pools of the streams are occupied by the dreaded crocodile, and there are the amphibious hippopotamus and numerous varieties of fish.

The forest is also the habitat of monkeys and the great apes, the chimpanzee and the gorilla, although the latter two also live in more open, rocky country. In addition there are innumerable insects, the beautiful and harmless as well as the malarial mosquito and the carrier of sleeping sickness, the tsetse fly.

The savanna is climatically a region of hot, humid summers and dry, warm winters. It everywhere surrounds the rain forest, and extends outward to the arid climates. Between these two extremes the savanna is climatically and vegetationally a transitional region.

North of the equator climatic savanna is largely equivalent areally to the Sudan, a boundaryless region extending 3,600 miles from the Atlantic to the borders of highland Abyssinia. The width of the savanna is the southern two thirds of the 600-mile belt lying between rain forest and the deserts of the Sahara. The northern third of the belt is the steppe which separates savanna from true desert.

While the Sudan savanna is climatically tropical, it is characterized by much greater atmos-

pheric variety than is true of the monotonous equatorial rain forest. The coolest month, January, averages 70° F., and the hottest, May, 90°. Midsummer months are cooler than May because they are the rainy season. The winter months are exceedingly dry; for day after day the dessicating *Harmattan* blows southward off the desert, at times depositing fine dust particles on the parched savanna earth. Summer rains come with reversal of the wind regime to transform the landscape. Precipitation falls in daily showers, as in the rain forest. Along the rain forest border the wet season is long and annual precipitation is 40 to 50 inches. The short rainy period on the arid margins brings only 8 to 10 inches to a region of very high evaporation.

South of the rain forest is another region of savanna much like the Sudan from which it is separated by the highlands of East Africa. There is no general regional name for this southern savanna; perhaps the Afrikaans term Veld (field) is the closest approximation. This southern savanna is roughly the area between the parallel of 5° S. and the Tropic of Capricorn. It includes western Madagascar and excludes arid southwestern Africa.

The Veld savanna follows the climatic pattern of the Sudan, allowing for the reversal of seasons in the southern hemisphere. In detail there are differences. South Africa is narrower and higher than is northern Africa. As a result the annual monthly temperature range, while remaining about twenty degrees, is dropped ten degrees lower on the temperature scale. The average for the coldest month is from 60° F. to 65°, while the maximum coming just prior to the summer rains is 80° to 82°. The low east coast is an exception. There the hot Mozambique current keeps temperatures up to equatorial levels.

A modified savanna climate occurs in parts of East Africa. The high plateaus in Tanganyika, Kenya, Uganda, and Abyssinia have an average elevation of 4,000 feet, with a considerable area above 6,000 and a little between 8,000 and 9,000. The major effect of elevation is to reduce the temperatures of a range that is already slight because of proximity to the equator. Nairobi, Kenya, for example, has an annual monthly temperature range of from 58° to 65°. Rainfall averages about forty-five inches annually for the whole high plateau region. Exposed mountain slopes get much more, while protected spots such as occur in parts of the Rift Valley approach aridity.

The natural vegetation of the savanna varies in accordance with transitional climatic conditions occurring between rain forest and arid lands.

From unbroken tropical forest there is gradual change to open savanna woodland that accompanies a drop in annual rainfall to between 40 and 50 inches. Typical rain forest species such as the oil palm disappear to be replaced by trees that are deciduous during the dry season. Between the trees is a growth of grass, from 5 to 20 feet tall, rank and tough during the rainy months and dead and withered during the winter drought.

A further drop in annual precipitation to 30 or 40 inches separates the trees more widely into a park landscape, with the massive baobab, the "sentinel of the savanna," curious flat-topped mimosas, and between them grass that is less tall because the wet growing season is shorter. Annual precipitation of from 10 to 20 inches reduces the grass to a height of 3 to 5 feet, inclined to grow in clumps or bunches between which there is bare ground. Trees are well scattered and they are commonly thorny, as illustrated by the widespread acacia. True forest trees are restricted to the galleries that flank perennial streams.

Finally, on the arid border of the savanna come broad expanses of almost treeless, low grasslands. The long dry season prohibits tree growth and restricts the height of grass. Nevertheless, this is the zone of best grazing for domestic animals, the tough, coarse grass of the wetter

savannas being much less edible and nutritious.

A different zoning of vegetation accompanies change in elevation on the high plateaus of East Africa. From 4,000 to 6,000 feet there is a normal park-landscape savanna. From 6,000 to 8,000 feet grows a tall dense forest that includes many bamboo thickets. In the few areas lying between 8,000 and 9,000 feet the forest is replaced by grassland.

The African savannas are to a greater degree than any other part of the world the natural habitat of wild, herbivorous mammals. As late as 1929 the numbers in a single great herd were estimated at ten millions. Antelopes, zebras, giraffes, elephants, and buffaloes are but a few of the many grazing species. The lion, leopard, and hyena are among the predators and scavengers. The savanna is the natural home of the flightless ostrich and the baboon. Brush areas are infested with the tsetse fly, and the malarial mosquito is present during the rainy season.

Arid climates. Africa's greatest arid region is the Sahara, culturally part of the Dry World. However, in the African World there is an arid area that takes in about a third of the continent south of the parallel of 10° S. For this arid area



Savanna landscape, East Africa (American Geographical Society)

there is no established regional name. Kalahari Desert is a term applied to the climatic steppe centering in southwestern Bechuanaland. Namib Desert is properly restricted to the coast of South-West Africa.

The one common climatic attribute of all arid areas is precipitation deficient to the extent of being less than possible evaporation. Those areas where the evaporation-precipitation relationship excessively favors the former are classed as desert. The arid areas that approach a balance between the two are called steppe. Steppes and deserts are generally characterized by unreliability of their meager precipitation, a minimum of cloudy skies, and high daily temperature ranges.

The coastal border of the Namib Desert is cold, foggy, and damp, yet its rainfall is virtually nil. The cold Benguela current lowers the temperature, causes fog, and prevents precipitation. Walvis Bay has an annual average temperature range of from 54° F. to 60°, and annual precipitation of practically zero. Further inland the annual and daily temperature ranges are greater and there is annual precipitation of two or three inches.

Along the whole coastal section of southwestern Africa there is a wide belt of shifting, vegetationless sand dunes through which no perennial stream passes. Back of the coast there is an isolated fragment of high plateau with adequate water. Most of the interior desert has intermittent streams, and a surface that varies from bare rock through gravel to a thin soil cover. Vegetation is everywhere scant, but there are occasionally acacia, cactus-like plants, and the unique *tumbo*, something intermediate between a creeper and a conifer.

The steppe centering about the Kalahari is dry enough to have cost the lives of many Boer trekkers who attempted to cross it. However, it gets from two to ten inches of summer rainfall. The surface is marked by salt-encrusted pans, lakes, and swamps, into which intermittent streams bring the interior drainage.

The moister margins of the steppe support bunch grass, acacia, and thorn bushes. In drier sections are shrubs, woody plants such as the Karroo bush, and water-storing succulents. The steppe is drab during the dry winter, but with summer rains there is a burst of flowering plants and grasses, hurrying to complete their short life cycles. To take advantage of the water and forage come herds of grazing mammals out of the savanna.

Mediterranean climates. At the very southern tip of Africa is a small area having the distinc-

tive climate known as Mediterranean. The qualities of this climate the world over are mild winters, cool to warm summers, and a moderate winter rainfall. The figures for Capetown are illustrative: January (summer) average 69° F.; July (winter) average 55°; maximum precipitation, June (winter) 4.4 inches; minimum, February (summer) 0.6 inches; annual total, 24.8 inches. Capetown and all the South African Mediterranean section have somewhat lower-than-average summer temperatures due to the cooling effect of winds blowing across the Benguela current.

Capetown is central to the 100-mile-wide Mediterranean strip that extends about 150 miles northwestward along the coast and a similar distance eastward toward Port Elizabeth. The northern boundary is the steep wall of the plateau, down which there occasionally blow warm dry winds to disrupt the normal course of summer weather. During southern winter invasions of cold polar air bring rainfall, and occasional frosts to the higher slopes.

The natural vegetation agrees in character if not entirely in species with that found in other Mediterranean regions. Plant adaptations to conserve moisture during the dry summer are common. In the areally restricted flat lands are evergreen, broad-leaved trees, shrubs, and grasses. On the lower dry slopes is an impenetrable, man-high growth of small-leaved evergreens, like the *maquis* of Mediterranean Europe and the *chaparral* of California.

On the high well-watered slopes are the remnants of a once-extensive cedar forest, comparable with that of the Atlas lands or with the famed cedars of Lebanon.

Without question, of all Negro Africa, the Mediterranean section is climatically best adapted to the health and well-being of Europeans.

Humid subtropical climate covers an area extending from the eastern boundary of the Mediterranean to the mouth of the Limpopo, and inland to the westernmost part of Basutoland. The general qualifications of this climatic type are mild winters, hot summers, and abundant rainfall, well distributed annually or with a summer maximum. Like conditions prevail in southeastern United States, where the name Carolina climate is commonly applied. Also falling within this climatic category are southeastern China, southeastern Australia, and the La Plata region of South America.

In South Africa the region occupied by humid subtropical climate extends from coastal lowlands to interior plateaus averaging over 4,000 feet in elevation. Considerable contrasts within the general climatic limitations are to be expected.

The coastal sections and the steep eastward-facing slopes have rather low annual temperature ranges (Durban, 65-77° F.), few or no frosts, high annual rainfall (42 inches) distributed evenly or with a short winter-dry season. Inland Johannesburg, at an elevation of 6,000 feet, has average annual monthly temperature extremes of 50° (June-July) and 65° (Dec.-Jan.), annual precipitation of 31 inches with a monthly minimum of 0.1 inch in midwinter, and frequent winter frosts. Interior winter weather is subject to dry dust-laden winds blowing off the desert.

Vegetation shows the variety expected to accompany the range of climatic conditions. Along

the coast and up to an elevation of 1,500 feet is a dense forest made up in the main of tropical species such as palms and bananas. From 1,500 feet to 4,000 feet is a belt of grass and thorn bush. From 4,000 to 6,000 feet is a temperate grassland, a continuous cover of grass about three feet high, very similar in character to the prairies of north-central United States. Aside from the marked vertical zonation, there are, high on the well-watered Drakensberg and in coastal sections of evenly distributed rainfall, patches of deciduous and coniferous temperate forest.

36: African World Peoples

Africa and the Negroids play very respectable parts in the racial history of man. Participation in biologic development was not restricted to those parts of Africa adjacent to Europe and Asia. What is possibly one of the significant steps in the origin of modern man is represented by *Homo rhodesiensis* or Rhodesian man, whose remains were uncovered at Broken Hill, Rhodesia, in 1921. If, as most modern authorities doubt, a number of scattered bones are part of one individual, Rhodesian man possessed a combination of primitive and human traits and might be regarded as ancestral to modern Negroids. Incidentally, this early man had bad teeth, mastoiditis, and a rheumatic condition. The geologic age of Rhodesian man has not been determined, but he may be as much or more than 125,000 years old.

Skeletons resembling Neanderthal man have been found in East Africa associated with primitive stone work dated by some at 75,000 B.C. Still in the Old Stone Age, man showing Negroid traits appeared in Europe. Skeletons of what are called Grimaldi man were found in caves located in extreme western Italy. It is assumed by some scientists that Negroid peoples, already distinct at that early time, had contributed to the physical make-up of Grimaldi man.

A modern type of man lived anciently in South Africa, as indicated by skeletal remains referred to as Boskop man. Modern Negroid types discovered in East Africa may date back to the early-middle Ice Age; at any rate they are questionably associated with early Old Stone Age implements, which suggests either that these Negroid peoples lagged tremendously behind Europe culturally, or else that modern types of man emerged in Africa long before they did elsewhere.

Despite the highly fragmentary state of the evidence, it can be said with assurance that Africa has played an important part in the biologic history of man, and that modern types of Negroids appeared at an early date.

RACIAL GROUPS

Even prior to the modern spread of Negroid peoples to the Americas and other parts of the

world, they were by no means confined to Africa. Negroid or part-Negroid peoples are found in all the peninsular projections of southern Asia. Negroid pygmies live in the Andaman Islands of the Bay of Bengal, the Malay Peninsula, Sumatra, the Philippines, and New Guinea. The Melanesians of New Guinea and adjacent islands are predominantly Negroid, and the same is generally considered to have been true of the now-extinct Tasmanians. The proportion of Negroid blood among some Polynesians is probably very high, and Negroid traces are found among American Indians and native Australians.

In the African World all native peoples, with the exception of some of the tribes of Madagascar, are basically of Negroid stock. Within this primary division of mankind there are a number of recognized types or subraces based upon physical characteristics. Some of these subraces are obvious mixtures with non-Negroid peoples; the origin of others is as yet unexplained. Table 23 is an adaptation of the classificatory scheme and terminology of Hooton.

It should be emphasized again that in addition to the subraces of the Negroid division of mankind listed in the table for Africa, there are the Oceanic Negroids living in Melanesia and the Asiatic Pygmies or Negritos. Also not listed in the table are predominantly Mongoloid Malayan tribes of Madagascar, peoples constituting only part of the island's basically Negroid population, and present as intruders into the African World.

Perhaps the Negroes did not emerge as a distinct racial division so early as the Caucasoids; they may have appeared earlier. In any event they certainly should not be regarded as simply primitive survivors from an earlier age. They, like other peoples, reveal in their physical traits both biological conservatism and great change. The broad, flat nose and the projection of the lower face characteristic of the Negro are probably very ancient. But the distinctive Negro hair textures, scarcity of body hair, small ears, full everted lips, and possibly the black skin are wide departures from the characteristics of primitive man.

Nor is there evidence to indicate that the Negroes as a people are mentally backward. There

may be inherent mental differences among the great divisions of mankind, but scientists thus far are unable to enumerate them with certainty. There is no reason to believe that the lag in cultural attainment exhibited by the African World is to be attributed to lack of intellectual capacity on the part of Negroid peoples.

RACIAL HISTORY

Despite finding the remains of pre-modern man in Africa, the continent is not generally regarded as the birthplace of all humankind. It is believed by most race historians that man entered Africa from the northeast. Distribution of the modern races or subraces and knowledge of migratory movements suggest the following sequence in the peopling of the continent.

First to cross into eastern Africa were a short Negroid people who were ancestral to the Pygmies and Hottentot-Bushmen. Accompanying them or following closely were the African Negroes. Differentiation of the ancestral stock into Pygmies and Bushmen preceded an eventual areal segregation of the former in the Congo basin and the latter in eastern and southern Africa.

Very early there pushed into northeastern Africa the first of a long series of Caucasoid Hamite invasions. By the time of the New Stone Age the African Mediterranean coast was dominantly Caucasoid and Caucasoids had pushed in some

number south into the Sahara. Mediterraneans moved southward into Abyssinia, the Horn, and well into the East African Plateau. The effects of these and other movements were to press the preceding peoples ever farther toward the continental margins and to create mixtures composed of various racial elements.

African Negroes comparatively free from mixture were secluded in the remote Guinea Coast region. In the equatorial forests were Pygmies and African Negroes who show some degree of mixture with their smaller kinsmen. The Bushmen were pushed southward and eventually restricted to the inhospitable, arid Kalahari. Some lagged behind, mixed somewhat with Hamitic Mediterraneans and African Negroes, then as Hottentot moved southward to adjoin the Bushmen in extreme South Africa. Mixture of Hamites with African Negroes gave rise to the Nilotic Negroes, still living along the invasion route into East Africa.

The last great movement was that of the Bantu-speaking Negroes, largely African Negro peoples racially, whose migrations were in part contemporaneous with the long Hamitic invasions. The Bantu-speaking Negroes seemingly originated as a linguistic stock in central eastern Africa, and became war-like carriers of the language to nearly all of Africa lying south of the equator, westward

Table 23 Racial Classification of the African World

<i>Primary Race: Negroid</i>			
<i>Primary Subraces</i>	<i>Characteristics</i>	<i>Distribution</i>	<i>Remarks</i>
1. African Negro	Woolly hair; dark pigmentation; broad, flat nose; variable stature; longheaded.	Dominant in western Sudan, Congo basin, and South Africa except arid region.	"Purest" Negroes; major source of American Negroes
2. Nilotic Negro	Slender; tall; very dark; long-headed; nose occasionally narrow; lips less thick than in African Negro	Eastern Sudan and Nile headwaters; occasionally elsewhere	Probably mixture of Negroid and Mediterranean
3. Negrito (Pygmy)	Very short; woolly hair sometimes in pepper-corns or spiral clumps; skin yellowish to chocolate brown.	Equatorial Africa	Widespread outside of Africa
<i>Composite Race: Bushman-Hottentot</i>			
<i>Secondary Subraces</i>			
1. Bushman	Short; slight; pepper-corn hair; mesocephalic; prominent cheek bones; Mongoloid eye; yellow to yellow-brown skin; steatopygia.	Kalahari, South Africa	Probably Pygmy-Mongoloid—Primitive mixture
2. Hottentot	Taller than Bushman; skin yellower and head longer.	Southwestern Africa	Bushman-African Negro-Mediterranean mixture

to the Atlantic and east to the Indian Ocean. They moved steadily southward, reaching the Zambezi River by the tenth century, and occupying South Africa in the nineteenth century, that is, all of it except a relatively small area of poor country left to the Hottentot-Bushmen. The Bantu came in contact with many peoples and mixed with them to become highly diverse racially.

For centuries Hamitic and Semitic peoples have touched the northern and eastern borders of Negro Africa. Hamites and Semites went into Abyssinia. Arabic Semites conquered the Sahara and sent slaving parties into the Sudan. Arab traders and slavers went south along the Mozambique Channel to both mainland and island Madagascar. Everywhere the invaders left their blood and cultural influences.

Madagascar has an even more complicated racial history. The original inhabitants were Negroid, thought by some to have come from Melanesia rather than from Africa. Arabs added Bantu-speaking slaves. But long before the Arabs, centuries prior to the time of Christ, there arrived the first of a series of settlers from the East Indies. The migrations continued intermittently into the sixteenth century. Even assuming that the Malaysians followed the coast, the trip was a masterly accomplishment for people using only outrigger boats. The modern inhabitants of Madagascar exhibit a heterogeneity matching their history. Some tribal groups suggest Malays, other Ne-

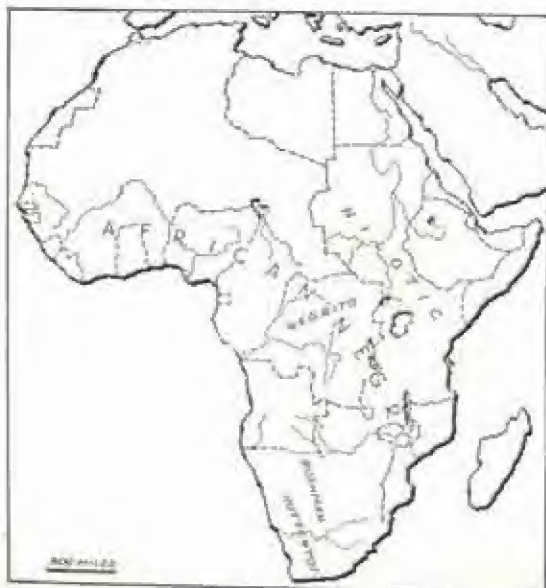
groids, but in the aggregate Negroid blood is dominant.

NATIVE LANGUAGES

Four language families: Hamitic, Bushman-Hottentot, Bantu, and Malayo-Polynesian, and a fifth group lumped together as Sudanese are represented in Negro Africa. A language family includes all languages known to be related by common even if distant origin. The individual languages comprising a family generally differ enough from each other to be mutually non-intelligible. The Sudanese group includes a number of what may be independent language families. The Sudan is often called a language shatter belt; its diversity of speech is matched by few other areas of comparable size in the world. Among the few are California with its many Indian language families, and the Papuan section of New Guinea with its confusion of unrelated tongues.

The names applied to the language families are suggestive of their distribution geographically and racially. Sudanese languages are not entirely restricted to the Sudan, but they dominate that region from the Atlantic to the edge of the East African Highlands, and extend sporadically beyond. Hamitic tongues are spoken in both East Africa and western Sudan. Bantu is the most widespread of native tongues, occupying the vast area lying south of the Sudan, with the exception of most of highland East Africa and arid southwestern Africa. Bushman and Hottentot are regarded by some students as branches of a common language family, Khoisan. In distribution they are confined to southwestern Africa and to the handful of surviving Bushmen-Hottentot. Finally, Malayo-Polynesian is the exclusive native language family of Madagascar. Malayo-Polynesian is entirely different from neighboring Bantu and obviously related to the tongues of Malaysia.

Language diversity in Negroid Africa is great enough to make inter-tribal communication difficult. While the speaker of one Bantu language can learn another easily, there is a limit to the number he can master. It is not surprising that trade languages have been adopted in several parts of Africa. In West Africa the common trade tongue is the Hamitic speech of the aggressive Hausa tribe. Even more important is Swahili in East Africa. The name Swahili means "coast dweller." This Bantu tongue, enriched by additions from many languages, is widely used along the coast and as far inland as Uganda and the Belgian Congo. At present it strongly rivals English as the common speech of commerce in eastern Africa.



African World; native races

Finally, let it be clear that just as Negroid Africans are not primitive biologically, neither are their languages marked by child-like simplicity. They are as complex, expressive, and usable as is any other speech and have been no handicap to the cultural development of the Negroid peoples.

CULTURE AREAS

Cultures never stagnate and become perfectly fixed and unalterable. Both outside and internal influences favor change, however slow or rapid it may be. Therefore, in describing cultures a plane of time reference must be chosen. For pre-literate peoples who can keep no written records, it is customary to select as the time plane the date of first direct contacts with civilization. It is assumed that these contacts mean a recording of facts regarding the primitive cultures, and their rapid alteration.

Negro Africa has always been subject to the infiltration of influences from civilization, even if only by slow transmission from one tribe to its neighbor. However, the process was greatly accelerated when Europeans began rounding the continent on their way to the Indies during the latter fifteenth century. Even a century later, when only the coastal sections were known to Europeans, depopulation of the native peoples was well started by the introduction of strange diseases, and new plant crops from America were already established. The historic period for the African World began during the sixteenth century; a more exact date would be quite meaningless for the continent as a whole.

According to Herskovits' classification the African World is divided into five culture areas: Bushman, Hottentot, East African Cattle Area, Guinea Coast-Congo, and Western Sudan. Contiguous to these geographically is a sixth, Madagascar. Excluded from consideration are the culture areas of the northern third of the continent belonging to the Dry World, such as the East Horn, Eastern Sudan, Egypt, the Desert Area, and the Mediterranean Littoral.

Following the customary practice, the present tense is used in describing native cultures. It should be kept in mind that in some respects and for some places the pre-European picture of native Africa bears but little resemblance to the present-day scene.

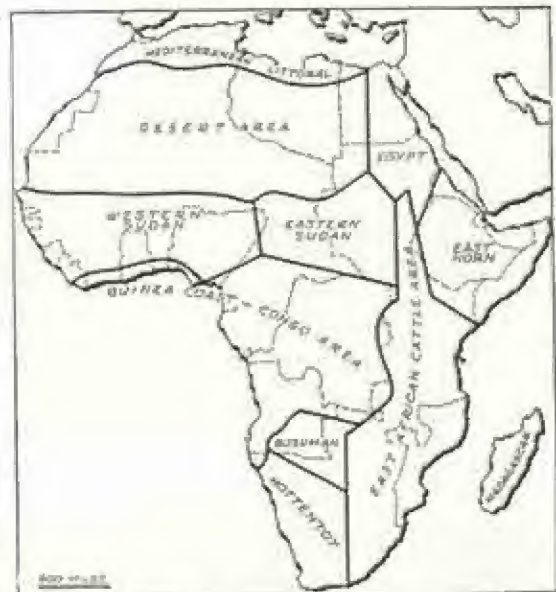
The *Bushman area* is the dry country centering around the northern Kalahari. It is a region of scant grassland and scrub, little available water, desolate salt pans, and dry stream channels. But it is not true desert in a climatic sense and it does

support a fair amount of animal life, both large and small.

The Bushmen are nomadic hunters who live where they make a kill. When they steal a cow from the neighboring Bantu or Hottentot, they run the animal to the security of a distant water hole and remain there until the meat is consumed. The Bushmen also collect fruits and all the small forms of animal life. From the acacias they get gum; from ant hills, eggs. They gather and eat with gusto not only honey, ostrich eggs, and roots, but even locusts and lizards. There is no agriculture and no herding of domesticated animals.

The variety of tools, weapons, and utensils is small. The bow is the chief weapon, and an effective one, especially when used with poisoned arrows. Bushmen manufacture a light hunting spear, stone scraper, and a digging stick, but do not work in iron. Pottery, axes, and throwing clubs are secured from surrounding tribes. Clothing is restricted to crude leather sandals and sewed leather cloaks. The women weave a carrying net from vegetable fiber, while the men make pipes in which to smoke wild hemp.

There are clever adaptations to the restrictions imposed by the land and the way of life. Animals are trapped, caught in pit-falls, and taken in community drives. The Bushmen are among the world's best stalkers and trackers of game. They are equally good at finding water. In addi-



Africa: native culture areas (adapted from Herskovits)

tion to knowing all the water holes, they can secure a potable drink from the fruit of a wild melon tree, or by sucking through a long tube from the deep roots of trees. Canteens for use in waterless terrain are made from blown ostrich-egg shells.

Alterations of the landscape are few and temporary. Dwellings are caves or brush and bark wind breaks, both to be abandoned readily when water, food, or other reason demands. A few simple belongings are packed in a carrying net when a little band of Bushmen moves certainly to its destination without benefit of path or trail. After a few months the only evidence of man remaining at the old site may be a pile of rocks marking a grave.

The Hottentot area lies in southwestern Africa, roughly west of the twenty-fifth meridian and south of the twentieth parallel. Most of the country is arid—it includes the Namib Desert—but it also reaches into the humid high plateaus of South Africa. Virtually all of the area is open, providing grazing of various degrees of excellence.

The Hottentot are close to the Bushmen racially and may be related linguistically, but culturally they are distinct. The Hottentot are cattlemen and most of their material needs are supplied by the herds. Sweet milk is a main article of diet and beef is the favorite meat. Cattle are used for transport and women, not men, milk them. Clothing is made of skin, and sandals are

of both skin and woven grass. The gathering of wild produce and hunting supplement herding in a minor way, but there is no agriculture.

Iron is smelted and worked into knives and spear blades. Pottery is made and mats and baskets are woven. The bow, throwing club, and spear are the principal weapons.

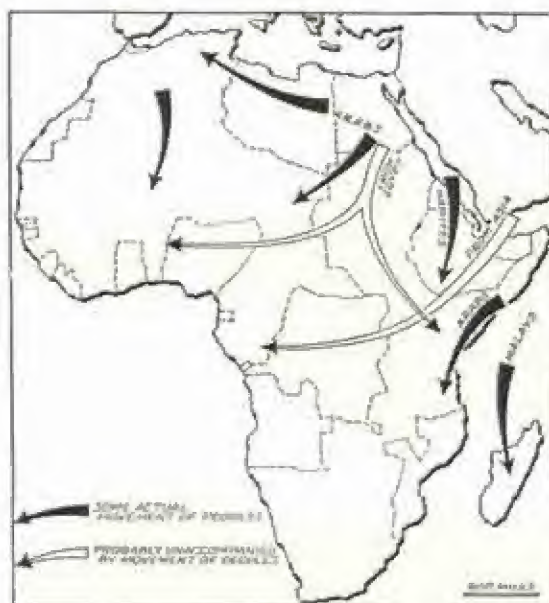
The Hottentot are necessarily nomadic since they must change pasture frequently. The village assemblage and construction are well adapted to caring for cattle and frequent moving. Surrounding the village is a crude but effective fence made of piles of thorn bush. Inside the fence in an irregular cluster are the beehive-shaped dwellings. The houses are made by sticking poles in the ground in a circle, then pulling the tops together and tying them. The domed framework thus constructed is covered with grass mats or hides. Also inside the thorn fence is a separate enclosure for holding the cattle at night. During the day the herds are carefully tended as they graze outside the fence.

When the time comes to move to new pasture, the house coverings are removed, the poles taken down, then both are dragged to the new location. The thorn fence is left behind, a reminder of the former presence of man and his herds.

The East African cattle area occupies the high plateaus of the eastern side of the continent from Abyssinia on the north to eastern South Africa. Higher elevations and less rainfall distinguish the East African cattle area from the forested Congo area to the west. In general the high plateaus are open or park landscape. There is grass for cattle, and, except for brush areas, the tsetse fly is not prevalent.

The word "cattle" in the term for the area is somewhat misleading, for actually agriculture matches herding in importance and is without doubt older in the region. Agriculture was the occupation of the original Negro inhabitants. The invasion of the Hamitic cattlemen from the north introduced a very different and often decidedly antagonistic economic system. The two systems exist side by side in places, and where they do the extensive differences are apparent. The farmers are decidedly more Negroid in blood and they are more or less sedentary. The herding tribes are more Caucasoid and are fierce warrior nomads. Especially in the south the two systems exist together, with women doing the agricultural work and men engaged in herding.

The herdsmen are thoroughly dependent upon their cattle. Sour milk is a principal article of diet; beef is the chief or only meat. In some sections cattle are bled regularly to provide choice food. Butter is churned, to be used principally



Africa: culture thrusts

for anointing the bodies of the upper classes. Taboos forbid mixing of vegetable food and beer with animal products. Clothing is made of leather and so are the war shields. Spears, swords, and clubs are used in fighting, but they are generally made by the artisan agriculturists.

The farming tribes raise crops and are craftsmen. They grow millet, plantains, bananas, sugar cane, peas, and beans, to which they have added maize, cassava, tobacco, and sweet potatoes from America. They have domesticated dogs, goats, poultry, and cows if they can get them. Groups of specialists make hoes from home-smelted iron, gather salt, and work in wood. The farming peoples also mould pottery, weave baskets, and pound out bark cloth.

There are two types of settlement to match the two cultures. The villages of the herdsmen are surrounded by thorn-brush *kraals*. Inside are round thatched houses or rectangular ones constructed of mud. Herds graze outside during the day, guarded and cared for by young men. The cattle are brought in at night and are milked then and again the next morning before being turned out for the day. When it is necessary to move to fresh pasture the village is abandoned and the farmers called upon to build another one at the new site.

The agricultural villages may be so situated as to afford protection from marauding herdsmen,

but they are normally not surrounded by a thorn fence. The thatched houses are typically round and are irregularly oriented in a cluster. A characteristic structure is a small raised house used to store the harvest. Close at hand are the fields, tilled exclusively with the iron hoe. Particularly where the fields are located in wooded lands unwanted by the herdsmen, they must be abandoned every few years and new ones painfully cleared.

The *Guinea Coast-Congo area* closely approximates the Congo drainage basin in distribution. It includes as well a narrow strip of Guinea coast extending as far west as Liberia. Thus this important culture area centers about and includes nearly all of Africa's rain forest. It is a region of constantly high temperatures, heavy precipitation, low elevations, heavy forest cover, and a dense network of perennial streams. The malarial mosquito and tsetse fly are everywhere prevalent.

Racially the Congo area is the most Negroid of all; that is, there is less obvious mixture with non-Negroid peoples. The area includes all the Negritos or Pygmies and is otherwise largely inhabited by African Negro racial stock. Culturally the Congo Area has been little subject to Hamitic, Arabic, and Mohammedan influences. The scarcity of grasslands and the prevalence of the cattle-



Kraal, Northern Rhodesia (American Geographical Society)

prohibiting tsetse fly have kept the herdsmen Arabics and Hamites out of the region.

The striking cultural similarities between the Congo area and the Oceanic Negroids of Melanesia have already been suggested. A formidable list of important culture traits is common to the two areas: the rectangular thatched house; the banana as a staple food; clothing of palm fiber or bark cloth; a straight bow strung with rattan cord; wood carvings of the human figure; the pig and fowl as important domestic animals; and many additional items. A culture combining the same elements is found nowhere else in Africa, nor does such occur between the Congo and the Melanesian Realm of the Pacific World. The many similarities suggest a cultural connection between the two areas. If so, the connection is an ancient one, and the two cultures may be remnants of one once common across southern Asia. In that case the two relict areas have been preserved because of a large measure of cultural isolation in rain forest habitats.

The basic subsistence activity of the Congo area is a shifting agriculture. New fields must be cleared every few years by girdling the larger trees, felling the smaller ones, cutting the brush, and thoroughly burning all woody slashings and refuse. Iron hoes are used to break up the ground to a depth of only a few inches. After two or three crops the ground is exhausted and is host to numerous plant-destroying insects. Abandoned fields may be used again after a few years, but the rapid growth of natural vegetation necessitates a new job of clearing and burning. Exceptional is a permanent agriculture as developed along the Guinea coast.

Bananas and plantains are staple crops, while millet, so important and so old in East Africa is missing. The list of food plants includes yams, beans, sugar cane, the oil palm, and a number of importations from America: maize, sweet potatoes, peanuts, tobacco, and cassava. With the last listed, cassava or manioc, came a process of steaming out the poisonous hydrocyanic acid contained in the bitter varieties. The domestic animals are pigs, fowls, goats, and dogs, all considered edible.

Wild animal foods supplement those from domestic animals. Fishing is a specialized and important occupation. The forests and occasional openings provide a fair abundance if not the choicest of wild game. The take of acceptable foods ranges from elephants and pythons to caterpillars, bats, and maggots.

The Guinea Coast-Congo peoples are workers

in iron, and occasionally in bronze and brass. From iron are made hoes, axes, knives, spears, hooks for snaring crocodiles, arrow points, swords, and razors. Brass and bronze are most frequently art mediums, but from them as well as from wood and clay are made the pipes smoked long before the arrival of tobacco largely displaced the use of wild hemp.

Wood-working as both art and craft reaches a degree of excellence in no way primitive. With tools limited mainly to axes and knives, the men make a variety of elaborate and beautiful articles, both decorative and utilitarian. There are decorated door posts, boxes, large and small dugout and large plank boats, stools, dishes, chains, spoons and stirrers, drums, masks, and beds. Human and animal forms are carved in elephant-tusk ivory.

Although little needed, to provide the simple clothing there is a cloth well made by weaving young palm fibers and another by pounding carefully to thinness the bark of the wild fig tree. Pottery is good and abundant, baskets can be woven to waterproof tightness, and there are loom-woven mats of vegetable fibers.

The Guinea Coast-Congo peoples live in villages ranging in size from a few families up to an exceptional hundred-thousand inhabitants. The dwellings are irregularly arranged along a street or around a square some thirty to forty-five yards across. In the center are a guest house and religious shrines. The houses are rectangular and gabled, the walls of wattle or thatch and the roof invariably thatched. The roof projects to outer supporting posts to provide a space that is open and cool and at the same time protected from the direct sun and rain showers. Suspended from a porch rafter is a net-supported porous jar containing drinking water cooled by evaporation. Back of the house is a kind of private courtyard. There stand the mortar, hollowed from an upended log, winnowing and sifting baskets, a mat loom, and other tools and utensils used in numerous household tasks.

Pigs, chickens, goats, and dogs are underfoot, and there is unfailingly a background of banana and plantain foliage. Never very far away are the gardens, commonly shifting to new sites from year to year. Some villages are protected by ditches or fences, and some by the simple expedient of hiding them back from the rivers, the routes of travel through the largely pathless forest. The cycle of activities calls for little travelling away from home except to the markets that are such striking features of the Congo culture pattern.

Different in their mode of living are the little groups of Pygmies scattered through the Congo

area. Their villages of small dome-shaped houses are hidden in the forests, not for security but rather to be near the game that is their chief source of livelihood. They are protected by their normal-sized neighbors and highly respected for their prowess as hunters. Aside from hunting, the Pygmies show little skill. Their clothing is nothing but draped skins. Such pottery, basketry, and crop foods as they have, and other of their tools and weapons are traded to them in exchange for meat by the Negroes, from whom the Pygmies have even borrowed their languages.

The *Western Sudan* culture area occupies approximately the southwestern corner of the broad northern Africa, excluding the Guinea coast. The Atlantic is a definite western boundary; Lake Chad is a satisfactory eastern one. The region reaches southward into the rain forest, but the great bulk of it is savanna and the humid margin of the steppe. The country is in the main open grassland, qualified for grazing by the general absence of the tsetse fly.

Culturally the Western Sudan is the most advanced area of Negro Africa. It has long been subject to the influence of strong non-Negroid peoples. Its striking departures from the Congo area are in part a measure of these and outside culture contacts.

Economies are agriculture, herding, and trading, in order of descending importance. Millet, cotton, and bananas are old staple crops. To them have been added maize, cassava, rice, peanuts, and sweet potatoes. Supplementing the limited number of animals found in the Congo are cattle, sheep, and even horses, camels, and donkeys. Clothing is made of both leather and excellent cotton cloth long woven in the area. Basketry is of good quality but relatively inferior to ceramics, which attains a high place in both art and pottery making. The same is true of tools and weapons of stone. Iron work reaches a peak for all Negro Africa,

and the Western Sudan is frequently regarded as the area from which iron spread to the remainder of the African World.

For as far back as there is any kind of record, there have been large native cities in the Western Sudan, some passing the hundred-thousand mark in population. Kano and Timbuktu are modern examples. In these cities composed of the typical mud-brick houses are farmers, herdsman, and traders. Specialists in iron, wood, weaving, or leather ply their trades. Large markets are daily events. Here native rulers grew to despotic power over large kingdoms: Songhai, Mandingo, and others.

Despite strong pressure from external sources, the Negroes of the Western Sudan retain their own Sudanese languages and offer stout resistance against conversion away from their native faiths to Mohammedanism, thus keeping a place in the African Culture World.

Madagascar is only geographically part of the African World. Racially it is probably more Negroid than Mongoloid, but linguistically it is Malayo-Polynesian and culturally it is an isolated region of the Malaysian Culture Realm of the Oriental World.

Characteristic culture traits of Madagascar that are distinct from mainland ways are innumerable. To mention a few that are illustrative, the hoe is unknown on Madagascar, and in its place as all-purpose agricultural tools are a digging stick and an iron spade; the double-cylinder bellows used in smelting iron is identical with that found in Java and Sumatra, and very different from the types used in Africa; the outrigger canoe is an importation from Malaysia that has spread to some extent to the African east coast; rice is a great agricultural staple and is grown on irrigated, terraced slopes, just as it is in the East Indies.

37: Exploration and the New World Revolution

The African World, lying south of the Sahara, was not easy to reach from the Old World. Though ancient Egypt and the Atlas lands are part of the African continent, the desert could be crossed only with great difficulty until the introduction of the camel, probably during Roman times. The Nile route, with its extensive marshes, was little easier than the Sahara, and the harborless African coast was hardly inviting to primitive navigators. Still, there were early contacts between Negro Africa and the outside world, as indicated by the ancient diffusion of many culture traits. The time and nature of such contacts are unknown, but in the main they certainly date to periods long before the beginning of recorded history.

The first creditable accounts of Negro Africa come from Herodotus, the Greek historian-geographer, who describes a circumnavigation of Africa by Phoenicians for the period around 600 B.C. According to the account, the voyage was sponsored by Necho, king of Egypt. It began in the Red Sea, proceeded southward along the east coast, and was completed two years later. Even more certain are trips of exploration down the west coast, made by Phoenicians *circa* 500 B.C., reaching the Senegal and Gambia rivers.

From the Phoenician colony of Carthage came traders and explorers. Hanno the Carthaginian supposedly reached the Gambia River around 500 B.C. There are also accounts of an overland trip across the Sahara to some large interior river. However uncertain the details of the discoveries, Herodotus mentions a large stream draining the country south of the Sahara, possibly the Niger; and ivory, gold, and slaves from tropical Africa appeared regularly on the markets of north Africa.

The Romans added little to the knowledge of the African World. They incorporated all the Mediterranean periphery into their empire then turned their attention northward to Europe. However, Greek traders got as far south as Zanzibar on the east coast during the first century A.D.

It was left to the practical and adventurous Arabs to complete the major accomplishments of exploration prior to the Age of Discoveries. With camels they established trade routes across the desert between tropical Africa and the Medi-

terranean. Though they hardly extended the known west coast beyond the discoveries of the Carthaginians, the Arabs became thoroughly established on the east coast as far south as Zanzibar and made their influence felt to the mouth of the Zambezi. Persian and Arabian traders secured slaves for their home countries and by the twelfth century A.D. had substantial colonies at Malindi, Mombasa, Sofala, and other points on the east coast. The thirteenth and fourteenth centuries were prosperous ones for the Arab traders and colonists, since they were without competition. However, the fifteenth century brought Europeans and eventually an intense rivalry for political, cultural, and economic domination.

The Arabs produced profound changes on the northern and eastern margins of Negro Africa. To the arid borders of the Sudan came the Arabic tongue, Mohammedanism, and material innovations. The faith of Islam was established in a thin coastal section bordering the Indian Ocean, solidly as far south as Zanzibar and intermittently beyond. To tropical Africa the Arabs brought rice and sugar cane from India. But Arabic cultural influences were areally limited, by the extent of dry country on the north, and to the narrow sphere of the trade settlements on the east coast. The forested interior, the damp west coast, and even the plateau savannas remained little changed by Dry World cultural influences.

To the Portuguese belongs the credit for opening Negro Africa to Europeans. The expulsion of the Moors from the Iberian Peninsula was followed eventually by a Portuguese invasion of Africa. Reports of the richness of the tropical regions induced Prince Henry the Navigator to train and dispatch numerous expeditions south along the African coast. The major discoveries came during the latter part of the fifteenth century, largely after Prince Henry's death. In order, the Portuguese passed and named the prominent coastal landmarks beyond Cape Bojador: Blanco, Verde, Palmas, and Aguilhas. At the mouth of the Gambia and on the Gold Coast they established trading posts to draw gold from the interior.

Diaz first rounded the Cape of Good Hope in 1487 and explored for a short distance up the east

coast. He was followed by da Gama who visited the east-coast Arab trade settlements. The Portuguese gave the names to Algoa Bay, Natal, Cape St. Lucia, Delagoa Bay, Cape Delgado, and other conspicuous natural features, and they seized political control of the Arab trade cities of Sofala, Zanzibar, Mombasa, and Malindi.

By the time of da Gama the major objective of Portuguese exploratory voyages was no longer Africa but rather, India. When the Ottoman Turks closed the old trade routes through the Levant, and the commercial city states of Italy weakened themselves through incessant petty warfare, western Europeans sought new ways to bring the spices, gems, and textiles of India to an eager home market. Da Gama learned from the Arabs of East Africa how to use the seasonal monsoons for the passage to and from India. After a few rich cargoes reached Portugal, interest and influence in Africa declined. Portugal was not a large enough country to maintain world-wide interests, so the African ventures suffered in competition with those involving the Indies and Brazil. However, on the Guinea Coast the Portuguese were the first Europeans to engage in the lucrative slave trade between Africa and the Americas and they were important in this connection until the abolition of the practice.

The decline of Portuguese influence in Africa was matched by a revival of Mohammedan strength. Oman, an Arabic country, freed itself of Portuguese domination and saved the East African coast to the Mohammedan world. By 1698 the Portuguese were excluded from the coast north of Delgado. As late as 1832 the sultan of Oman transferred his seat of government from Arabia to Zanzibar.

Despite the reduction of Portugal's importance, it was the Portuguese who pioneered in bringing a part of Negro Africa into the New World. Africa south of the Sahara was unknown to Europe prior to the Age of Discoveries. The Portuguese outlined the coast, originated the slave trade, dealt in gold and ivory, and aroused the envy of other European maritime powers. It was they who delivered the first blow of the European impact and fired the first shot in the New World Revolution that initiated for Africa a still-uncompleted commercial, political, and cultural transformation.

Old World and New World are purely European concepts that have nothing whatever to do with geologic or racial age or history. The Old World is the portion of the earth known generally to Europeans prior to the beginning of the Age of Discoveries in the fifteenth century. To the New World belongs everything else: the

Americas; Australia; New Zealand; Oceania; Arctic Asia; and Africa south of the Sahara. Obviously the term New World is not, when used in this sense, confined to the Americas. Southern Africa is just as much a part of it. North and South America constitute less than half of the New World areally.

The effects of the impact of Europeans upon aboriginal New World peoples are revolutionary. Common is a depopulation, occasionally to extermination. Introduced epidemic diseases, frequently those comparatively harmless to Europeans, are fatal to primitive peoples to whom they are new. Warfare finds all the advantages on the side of the technically superior invaders. To the native the weapons, tools, and utensils of Europeans are obviously better than the crude products of his own craftsmanship. The conviction of the superiority of European material ways may carry over to social, moral, and spiritual values. It is impossible for the native immediately and logically to preserve the better aspects of his older ways and select from European ways just those things that fit best his system of life. The net result is a demoralization of the natives for a period of time during which they flounder about, robbed of their own adjustments for living and unable to make a quick and complete transition to European ways. In some instances there is eventual evolution of a successful new system which is generally a mixture of old and new ways, but invariably with concessions to a commercial rather than a purely subsistence existence. For most of the New World where the aboriginal population remains numerically dominant, the development of a successful new culture has not yet been attained.

Even in those sections of the New World where native peoples have been exterminated or reduced to negligible numbers, the succeeding Europeans are slow to develop a harmonious relationship with the land upon which they live. Pioneering vast new countries inspires a feeling of inexhaustible natural resources and a contempt for careful husbandry. Impeding forests must be cut and competing wildlife reduced. An urge to commercial profits means wastage of soils and minerals. There is always more just beyond. When the end of "inexhaustible" resources is approached it is difficult to change attitude and manner of utilization. In few sections of the New World does the visitor from Europe, a land long forced to conservative and sustained use of the natural endowment, get the impression of a similarly sane and long-time adjustment of man to nature. Lavish

use and waste everywhere offend his sense of propriety. Whether it be aborigine or European working blindly toward a stable and satisfying way of life, the profound changes involved are well named the New World Revolution.

The Revolution is not nor has it been simultaneous in all sections of the New World. It is nearly 450 years old in Cuba and Mexico but has not reached completion. After scarcely a hundred years New Zealand is much farther along than is Mexico. Interior New Guinea and parts of interior South America are untouched. The Revolution has come with full force rather late to most parts of Africa. The major effects are felt in the more accessible coastal sections; it has yet to change materially such remote peoples as the Pygmies of the central Congo.

In broad plan the pattern of the New World Revolution has been the same the world over. It varies in detail for the various lands where it has taken place but is like a set drama in which certain characters playing assigned parts are always expected to appear. First on the stage are primitive aborigines, impressed to awe and then mistreated to resentment by invading Europeans. The European characters represented are explorer, trader, missionary, soldier, settler, and politician. Their order of appearance may vary somewhat; several may appear simultaneously; perhaps some may not appear at all.

The first explorers or discoverers have generally been hard-headed individuals with an eye to economic opportunities. Scientific exploration, that is, exploration simply to add to the sum of human knowledge, is a comparatively late chapter in the annals of New World discoveries. However much the early explorer may have been interested personally in scientific truths, he justified his journeys to his supporters by finds of commercial value.

Hard on the heels of discoveries came the trader, to utilize the information brought back by the explorer. Then and now the trader's primary interests are immediately available commercial assets, such as furs, slaves, valuable metals, gems, and forest products. The gatherers or producers of these articles are the aborigines. They must be compensated for their efforts or they will not work. Since money is meaningless, payment takes the form of European-made goods: trinkets, tools, utensils, textiles, tobacco, foodstuffs, and whiskey. A growing dependence by the natives on imported goods secures the supplying of desired articles to the trader. The aboriginal population is then tightly and permanently enmeshed

in the net of the European commercial system.

The missionary's prime purpose is to save souls by converting the native pagans to Christianity. He frequently works at cross purposes with the trader, whose degrading influence on the aborigines he tries to offset. Yet, quite unwittingly, the missionary furthers the spread of the European economic system by inducing the native to wear clothing patterned after his own and otherwise to ape civilized customs. The only way to supply the newly created demand for European goods is by dealing with the trader.

The soldier, representative of European nationalism, often enters the scene on the pretense of protecting trader or missionary against resentful natives. Punitive expeditions have the habit of growing into permanent garrisons. With the military come the political administrator and the protectorate. The latter term originally meant a retention of native rulers and noninterference in local affairs, with Europeans taking over external affairs and guarding against the aggression of rival colonial powers. Protectorates easily become possessions and integral parts of centrally administered empires.

Permanent possession, by reducing the element of risk, encourages the investment of capital sufficient to engage in the exploitation of natural resources on a scale far greater than that undertaken by the trader. Frequently this takes the form of large mining enterprises or extensive and intensive commercial production of agricultural crops. Particularly is the latter true in tropical lands that can produce needed materials for temperate countries, such as rubber, sugar, coffee, cotton, cacao, tea, kapok, hemp, and copra. Plantation agriculture, large mining operations, and the exploitation of forests, are typical expressions of colonial economy. The colonies yield the raw materials needed by the home countries. The native populations generally provide the labor for production under European supervision. Also, the colonies are closed markets for goods manufactured in Europe. It is a system devised for the economic benefit of the colonial powers and not for the aborigine.

Colonization by Europeans is a possible but not a necessary step in the completion of the New World Revolution. Implied in this step is the permanent establishment of a population of European blood, generally at the expense of a native depopulation. Also necessary to true colonization is sedentary agriculture after the Old World plan, where settlers are something more than mere supervisors of non-European laborers. Accompanying features of true colonization are urbanization, industrialization, and other common fea-

tures of the European culture pattern. European colonization has been eminently successful in temperate lands and even in tropical highlands. It has yet to prove its adaptability to tropical lowlands.

Shifts of racial stocks other than European and native have accompanied the New World Revolution. Europeans brought African Negroes to the Americas; in the tropical lowlands bordering the Caribbean Sea they are now the dominant racial group. Various Oriental peoples are established in the Americas, as, for example, in the United States, the British West Indies, and Brazil. The islands of Oceania include large Oriental elements, particularly in the areas devoted to plantation agriculture. Asiatics have been brought to South and eastern Africa, where they now constitute important parts of the population. Most of these racial shifts are to be attributed to the labor demands of European commercial enterprises and the reluctance or inability of native populations to supply them.

The New World Revolution can be said to be completed in any area when it no longer bears a mere colonial political and economic relationship to Europe. It must have attained a large measure of economic and political independence and stability within the system of world relationships. Such a position indicates a thorough establishment of European institutions and the local production of at least the primary necessities of life. That is, when mines or plantations are worked by natives only slightly removed from savagery and supervised by a few Europeans who import even their food, the New World Revolution is in its early stages. On the other hand, where a country is politically sovereign and occupies a position of economic independence similar to that of the more-advanced European nations, the New World Revolution has run its course.

By these standards the New World Revolution approaches completion in the United States, a few of the Latin American countries, and among some of the British commonwealths. In the African World only the Union of South Africa attains this status.

NEW WORLD REVOLUTION IN AFRICA

The Portuguese, as previously described, were the pioneer European explorers of Negro Africa. During the fifteenth and sixteenth centuries they outlined the coast and named the principal capes and indentations. Unlike their east-coast rivals, the Arabs, the Portuguese rarely ventured inland, since their interest in trade and the use of African ports as way stations to India did not require it.

The decline of Portuguese power in the latter part of the sixteenth century was followed by their expulsion from the east coast north of Cape Delgado by the Arabs. On the west coast Dutch, British, and French superseded the Portuguese between the Senegal River and the equator by the middle of the seventeenth century.

With the exception of the Arabs in East Africa and the Dutch and French among the islands of the same area, there was little addition to the exploratory work of the Portuguese until the closing years of the eighteenth century. The coast between the mouth of the Gambia and the Cameroons, and especially the Gold Coast, was the goal of innumerable trading expeditions seeking slaves and gold, but the Europeans remained on the coast and conducted their dealings through native middlemen.

A new region was opened when the Dutch in 1652 established a port of call on Table Bay in South Africa. The purpose of the settlement was to provide water, provisions, and repair facilities for ships making the long trip to or from the Indies. Agriculture was fostered to provide food for vessels calling at Table Bay. The Dutch farmers or Boers expanded slowly to the northeast, but detailed exploration of South Africa did not get under way until the beginning of the nineteenth century.

The scientific attack by Europeans upon the unknown interior of Negro Africa was formally inaugurated with the organization of the African Association of London in 1788. First concern of the new era of exploration was the Sudan and central-western tropical Africa. South and central Africa received major attention only after the



African World: European exploration

middle of the nineteenth century. Basic exploration of the continent was ended about 1875.

The list of African explorers embraces many famous names, among them Park, Barth, Livingstone, and Stanley. English, French, German, Portuguese, even an American, Stanley, and other nationalities contributed to the knowledge of the continent's geographical features, and often, perhaps unwittingly, established the imperial claims of the countries they represented. Among major milestones in the chronology of discovery were the fixing of the lower course of the Niger in 1830; the sighting of Mt. Kilimanjaro in 1849; the east-west crossing of the Sudan in 1849-56; the detailing of the Zambezi country by about 1860; and the clarification of the problem of the Congo drainage system around 1875. Tropical Africa held many dangers for Europeans in the form of diseases and war-like natives, so that its exploration was accomplished at the cost of many lives.

EXPLOITATION BY EUROPEANS

Just as slaves, ivory, and gold were of primary interest to the Carthaginians, so were they eagerly sought by the Portuguese and their fellow European successors. The Gold Coast was the center of a coastal strip where trade rivalry among Europeans was keen during the seventeenth and eighteenth centuries. The Grain or Pepper Coast, Ivory Coast, Gold Coast, and Slave Coast are names indicative of the commercial interests in the area.

During the early stages of primitive exploitation the white traders operated through coastal trading posts. These posts were entrepôts or gathering points where local African chiefs and Arabs from the north brought slaves, ivory, gold, and pepper to be exchanged for European goods.

The slave trade reached large proportions by the end of the eighteenth century. Portuguese, British, Dutch, French, and American vessels were transporting some hundred-thousand slaves a year to the plantations of America. Each nationality had a homeland base of operations that formed the third vertex in a triangle of trade; slaves from Africa to America; sugar and other plantation products from America to the home port; then rum, cloth, and other manufactured articles back to Africa to be exchanged for another cargo of slaves. On the African east coast Arabs were quite as industrious, transporting slaves to Arabia, Persia, and other Asiatic lands. Their procedure differed somewhat in that par-

ties of Arabs operated regularly inland as far as the lake country.

Gradually exploitation became more intensive and less haphazard. Traders were supplemented by persons concerned with the extracting or securing of the desired articles. Materials of less concentrated value than gold and slaves were added to the list of exports to Europe. Oil from oil palms, timbers, and eventually rubber demanded far greater effort to secure than the mere passing of rum or cloth across the counter of a primitive trading post.

The attitude of Europeans regarding Africa's commercial place changed to keep pace with the economic developments at home. The growth of the industrial age pointed to Africa as a source of raw materials and foodstuffs for Europe and as a market for cheap manufactured products. To secure stability of production and marketing opportunities, a measure of political control over the areas involved was deemed a necessity. It was also clear that controlled agricultural production insured a steadier and more diversified supply of raw materials than simple gathering and bartering.

In the closing decades of the nineteenth century the semiofficial British East Africa, South Africa, and Niger companies were organized to operate in the regions suggested by their names. In the Belgian Congo and French Equatorial Africa enormous private grants of land were made to companies at first interested primarily in gathering rubber from wild trees and vines, a thriving industry until the appearance of plantation rubber from Malaysia. The discovery of diamonds during the last quarter of the century brought prospectors and miners to Africa, and new imperial ambitions and riches to Europe.

Plantation agriculture was a final step to secure the supply of raw materials. Uganda, Tanganyika, the Cameroons, Belgian Congo, Nigeria, the Guinea Coast, and other areas were involved in the production of a growing list of plantation crops: cacao, hemp, cotton, coffee, sugar, bananas, palm oil, tobacco, rubber, pyrethrum, and many others. The "righteous" Europeans had long since abolished human slavery and regarded with horror its persistence in Arab communities. However, to work the plantations, mines, and other industries, they initiated a system of forced labor that differed from slavery only in unimportant respects as far as the natives were concerned. The Negro fares poorly in most regards.

The expansion of exploitation brought material changes to the visible landscape. The clearing of forests and the establishment of plantations, mines, and communities of Europeans were radical inno-

vations in the older cultural scene. Ports were constructed and river transportation by steamer instituted. A rail line was built by the British inland through Kenya and Uganda to the Great Lakes communities, and to the same destination another was laid by the Belgians from the upper Congo, and still a third by the Germans through their East African possession, now Tanganyika Territory. In South Africa rail lines were constructed to connect the coast with the interior mining fields.

The effects of the New World Revolution upon the native Africans may be divided into several related categories: depopulation and population shifts; alienation of lands; and cultural changes. Quite naturally the extent of the changes bears a direct relationship to the degree of European penetration. Coastal areas in general show the greatest degree of alteration; interior regions the least.

Estimates of the trend of population numbers are at best vague. Eighteenth-century guesses placed the continental total at around 150 millions. The explorations of the middle nineteenth century reduced the estimates to between 28 and 41 millions. Stanley's reports raised the figure to 180 millions, and optimistic estimates of 1882 to slightly over 200 millions. Since 1903 there have been various figures ranging between 126 and 149 millions. In 1934 Dr. Kuczybski's careful study produced an estimate of 145,054,000, with a possible range between 138,100,000 and 163,300,000. Of Dr. Kuczybski's median figure, between 90 and 100 millions are Negroid natives of the African World.

Despite the uncertainty of the data, it seems quite possible that the eighteenth, nineteenth, and early decades of the twentieth century witnessed a decline in numbers of Negroid Africans. European-introduced epidemic diseases and the rapid spread of fatal native African diseases favored by better communications took their heavy toll. The slave trade claimed as many as 100,000 annually. Bloody native wars virtually depopulated large areas in East and South Africa before they were put to an end by Europeans. The system of forced labor practiced in Belgian Congo and French Equatorial Africa robbed villages of the more vigorous males and so reduced the birth rate. So definitely downward did the vital balance appear to be that serious students have predicted the disappearance of native populations for sections of equatorial and southern Africa. Expert opinion regards the Negroid population as stationary in numbers at the present time, finding that there are gains in some areas to offset losses in others.

The most important shifts of native population caused by Europeans are those that have taken place in connection with the long-practiced system of forced labor, in which natives are recruited where they are numerous and transported to other areas to work. Many never return to their native villages, thus affecting vital trends and producing significant cultural and racial changes. The shift of from 2 to 3 million individuals accompanied the concession system as practiced in French and Belgian equatorial Africa. Fewer were involved elsewhere, but the practice has been widespread throughout most of Negroid Africa.

The history of alienation of land in Africa shows broad parallelism to the procedure of Europeans in securing the lands of the American Indians. In general the lands wanted for any purpose by Europeans were taken, either directly with no consideration of the rights of the natives or through purchase from tribal chiefs. European powers appropriated lands as crown possessions and doled them out to individuals or companies. Long and vigorous protests against disregard of the needs and rights of the aboriginal peoples finally resulted during the last few decades in the setting aside of native reservations and the limiting of further alienation. Nevertheless, older European claims were confirmed, and in extreme cases there are sections where no native owns land.

Without here going into detail, it can be pointed out that native cultures have experienced all degrees of cultural revolution. At one extreme are remote Pygmy groups, virtually unchanged in their way of living. In an intermediate position are more accessible tribes that are dependent upon European articles such as weapons, tools, and cotton textiles, but otherwise live much as did their ancestors. At the other extremity of the scale of change are detribalized Negroes who live in ports and industrial cities, notably in South Africa, very much after the fashion of white people of the same low economic status.

EUROPEAN POLITICAL DOMINATION

The partitioning of Negro Africa by European imperial powers was largely accomplished during the period between 1880 and 1900. The major participating nations were Great Britain, France, and Germany. Rivalry among the three permitted small Belgium and Portugal to gain or retain large territories.

Early trade interests provided bases and lo-

calized areas of political expansion. After the elimination of the Portuguese north of the equator in about the middle of the seventeenth century, England acquired special interests in Sierra Leone and at the mouths of the Gambia and Niger rivers; France at the mouth of the Senegal; and both in the Gold Coast. However, political claims came late. Not until 1807 was there the first pronouncement of territorial annexation, and that was the establishment of the British Crown Colony of Sierra Leone for the express purpose of providing a home for liberated slaves. A few years later and for the same purpose was the founding of the independent country of Liberia under American auspices.

France was the first nation to plan and get underway a program of colonial acquisition. Somewhat after the middle of the nineteenth century the French African empire began expansion inland from bases in the Ivory Coast, Dahomey, and at the mouth of the Senegal. The direction of spread pointed toward the Sudan and lands that later became French Equatorial Africa. The British, alarmed at French progress, and fearful of being restricted to isolated coastal territories, began a belated expansion inland in Sierra Leone, the Gold Coast, and Nigeria. In the Ashanti tribesmen of the interior Gold Coast the British met the only serious native opposition encountered by Europeans acquiring West African possessions. The lack of organized native resistance in this part of Negro Africa stands in striking contrast to the difficulties encountered

in subduing the Arabs and Berbers of the northern, Dry World portion of Africa.

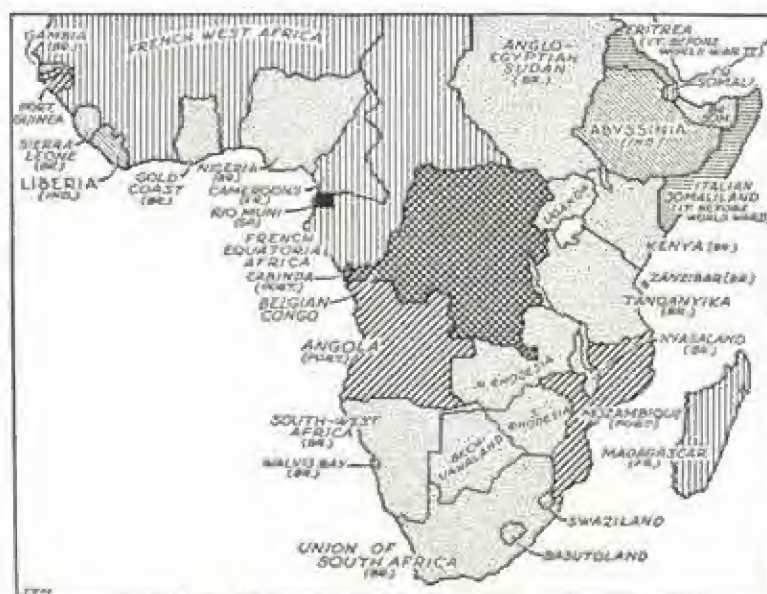
The German entry into the West African scene came late and with startling abruptness. In the year 1884 the Germans made their first African territorial claim, but within the year they held Togoland, the Cameroons, and South-West Africa. Germany was growing industrially and, like Britain, realized the advantages of controlling the sources of raw materials and at the same time markets for manufactured goods.

Belgium jumped into the colonial grab under the guise of fostering scientific exploration. The International Association of the Congo founded by King Leopold of Belgium in 1876 quickly became an instrument for furthering political domination. The Congress of Berlin of 1884-1885 recognized the political identity of the large section of equatorial Africa that eventually became Belgian Congo, after passing through an intermediate stage as virtually a personal possession of King Leopold.

Portugal's claims to Angola and Mozambique were well founded upon discovery and trade utilization. But the recognition of the claims was the result of French and German attempts to thwart Britain's expansion in southern Africa. A Portuguese try for the territories lying between Angola and Mozambique was vigorously opposed by Great Britain, with the result that the latter acquired what eventually became Northern and Southern Rhodesia.

The partitioning of the last major free countries of the African World took place some ten years before the close of the nineteenth century. The scene was East Africa, the participants Britain and Germany. To the former went Kenya and Uganda, to the latter German East Africa, now British Tanganyika. The littorals of both Kenya and East Africa were "leased" from the Sultan of Zanzibar, over whose home territory the British assumed a protective custody.

In South Africa the Dutch-founded Cape settlements



African World: political map

have been continuously British since 1814. Resentful Dutch farmers pushed northward to found the independent Orange Free State and Transvaal. British ambitions to possess a clear sweep of territory from the Cape of Good Hope through Rhodesia, the discoveries of diamonds and gold in the Dutch territories, and the growth of a considerable British population in the mining regions, were reasons and excuses for absorbing the areas involved into the empire. It took the Boer War of the turn of the century to accomplish the move.

The end of World War I witnessed a division of German possessions in Africa. To Britain went most of German East Africa, thus realizing Cecil Rhodes' dream of a continuous British sphere "from the Cape to Cairo." South-West Africa became in effect a fifth major division of the Union of South Africa. To France went the larger parts of German West Africa, and a slice of highland East Africa was added to the Belgian Congo.

The present political status of the African World leaves only tiny Liberia a completely independent and unaffiliated nation, and this is a concession to the vigilance of the United States. The varying political positions of the numerous areal units are illustrated by the composition of the British Empire in Africa. The Union of South Africa, composed of four states, the Cape, Natal, Orange Free State, and Transvaal, and an anomalous mandated territory, South-West Africa, is an independent dominion within the British Commonwealth. Southern Rhodesia is a self-governing state, intermediate in position between a dominion and a crown colony. All other British areas, whether they be protectorate, colony, or trusteeship, have crown-colony government, in which there is control over administration by the Imperial Government, with various degrees of local self-government.

EUROPEAN SETTLEMENT

European settlement in the sense of an agricultural-industrial economy operated by white men faces natural disadvantages in the African World. There is a large proportion of arid land. Except for limited areas, temperatures are tropical. While the precious minerals are abundant, others, important industrially, such as coal and petroleum, are deficient.

In only one section, South Africa, is there an abundant, well-established European population. Here white people number slightly over 2 mil-

lions out of a total of over 11 millions. The choice Mediterranean coastal strip near Capetown, the humid subtropical land of the southeast, and the high veld of the eastern interior are the main theaters of European settlement. Northward, increasing proximity to the equator is supplemented by lower elevations in an unfavorable climatic combination that results in a smaller proportion of Europeans in the total population. Aridity produces the same effect in the western part of the Union.

By the end of the nineteenth century it was apparent that European settlements in the tropical lowlands would always be severely restricted by adverse environments. Aside from South Africa the only other likely area for white men appeared to be the high plateaus of East Africa. Not until after World War I was there a considerable European immigration to the Kenya Plateau, where white people now number some 30,000, numerically far inferior to other racial groups.

Elsewhere in the African World Europeans are both relatively and numerically insignificant. In Southern Rhodesia they number around 116,000. For Belgian Congo, French West Africa, and Mozambique there are in each between 10,000 and 20,000 Europeans. In no other political division are there more than 10,000.

In addition to Europeans there are other foreign colonizers in Africa. In East Africa are some tens of thousands of Arabs. Kenya, where they are most abundant, has 12,000. But most important numerically of non-European immigrants are eastern Asiatics, predominantly Indians. In South Africa are 220,000 of them, about one ninth the number of Europeans. In Kenya the Indians roughly double the 20,000 Europeans.

It is clear that to date Europeans have shown little progress in colonization except in South Africa. Italians, Greeks, and various Levantines have had considerable success as traders in eastern Africa. Whether they would do well as true colonists is a moot question. Commercial dealings are quite different matters from actually living on the land and off its fruits.

It is reasonable to believe that the African World will remain overwhelmingly Negroid in blood. When the New World Revolution is an accomplished fact, it will have acted primarily on and through Negroid rather than Caucasoid peoples.

38: Modern Cultural Landscapes: Northern Negro Africa

The modern cultural landscapes are the latest in a series that began with earliest man. Prior to the beginning of the New World Revolution in Negro Africa, there was a measure of cultural stability, or at least changes grew logically out of the older landscapes. The New World Revolution inaugurated a flood of alien traits, with resultant effects upon the observable scene.

Today the primitive cultural landscapes are everywhere modified to a greater or lesser extent by the addition of European elements. Railroads, cities, farms, plantations, foreign racial groups, and the forms associated with forest and mineral exploitation by their frequency reveal the extent of European penetration.

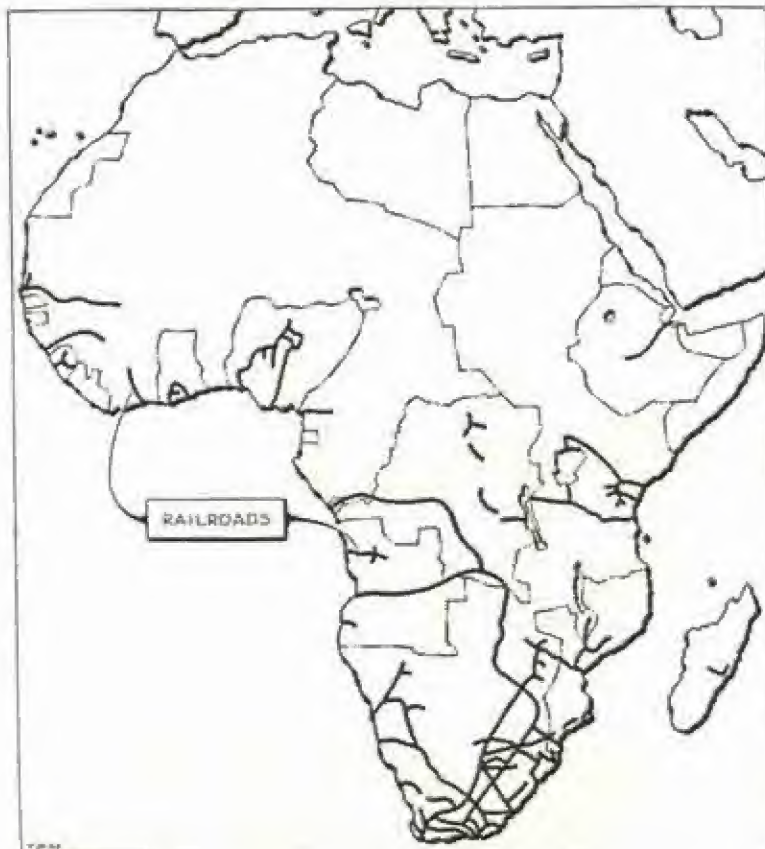
GENERAL CHARACTERISTICS

The African World embraces a total area of about 7.0 million square miles or about two thirds of the continent. For this area the population inclusive of all racial elements is roughly 130 millions, of whom all but 3.0 millions are Negroids.

The average density of population is about nineteen per square mile, lowest of all the inhabited continents with the exception of Australia. The variation from the average is great. Least densely populated of the major political divisions are arid Bechuanaland and South-West Africa, with 1 and 1.1 per square mile, respectively. At the other

extreme is the district of Ruanda-Urundi, part of former German East Africa now in trust to Belgian Congo. For this area the average density of its 2.5 million Negroid inhabitants is 165 per square mile. The principal region of European settlement, South Africa, has an average density of twenty per square mile. Within the Union the native population of Transkei is relatively dense, with nearly sixty per square mile.

In general the Guinea coast, from Nigeria to Gambia, has nearly four times the average density of the African World. French West and Equatorial Africa, Angola, and both Rhodesias are well



African World railroads

under the average, while Belgian Congo and Mozambique equal it. Uganda, whose nearly forty per square mile meets the world average, is among the more densely populated portions of Negro Africa. Since industrialization is nowhere far advanced, European-settled areas are not strikingly more dense on the average than are regions with native populations.

A second striking imprint on the landscape is the transportation system, notably the railways. Although most African railways have been built in anticipation of the growth of traffic, the densest networks are a response to commercial developments. Of all the political divisions of Africa only British southern Africa has a system comparable with other advanced world regions. A mileage of some 20,000 puts this section far ahead of any other in the African World.

Aside from narrow southern Africa no rail line crosses the continent and there is none continuous, north and south. Many railroads are unconnected lines extending inland from a coastal port or joining navigable sections of interior water-

ways. The newer development of automobile roads and air transport may well halt a further intensification of the railway network.

Finally, there is a third significant landscape form, the city, that has strong implications regarding the cultural status of its builder. In Africa of the Negro there are large cities only in the Sudan and southern Nigeria; Kano, Timbaktu, and Ibadan, for example. The latter has a population of some 350,000. These cities are quite anomalous in having developed in a culture world that has generally lacked the trait of urbanization.

The largest cities of the African World and the custom of living in cities are expressions of European culture. Large cities are generally but not always associated with industrial or commercial development, according to the European pattern. Thus South Africa, the only country where European ways and peoples are thoroughly established, has a virtual monopoly on the cities. Johannesburg, with nearly one million, is the largest

Table 24 Divisions and regions of the African World

<i>Divisions & regions</i>	<i>Area in sq. miles (thousands)</i>	<i>Population (thousands)</i>	<i>Political status & remarks</i>
The Guinea Lands			
Senegal	77.73	2,093	French; including Dakar & dependencies
Gambia	4.07	252	British
Port. Guinea	13.94	511	Portuguese
Fr. Guinea	96.89	2,257	French
Sierra Leone	27.93	1,975	British
Liberia	43.00	1,648	Independent; U.S. commercial interests
Ivory Coast	184.17	2,170	French
Gold Coast	78.84	4,340	British; including Togoland trust territory
Dahomey	65.04	5,686	French; including Upper Volta and trust territory
Nigeria	372.67	31,193	British; including Cameroons trust territory
Cameroons	166.50	3,077	French trust territory
Spanish Guinea	10.41	199	Spanish; Rio Muni, Fernando Po, Corisco, & Annobon
Western Sudan			
French Sudan	590.97	3,445	French; largely outside African World
Niger Territory	499.41	2,165	French; largely outside African World
Central West Africa			
Fr. Equat. Africa	939.24	4,435	French; partially outside African World
Belgian Congo	923.27	15,670	Belgian; including Ruanda-Urundi
Angola	490.79	4,145	Portuguese; including Cabinda
East Africa			
Kenya	224.96	5,454	British
Uganda	94.00	5,200	British
Tanganyika	362.70	7,787	British trust territory
Zanzibar	1.02	264	British; including Pemba
Southern Africa			
Nyassaland	47.40	2,469	British
North. Rhodesia	230.30	1,741	British
South. Rhodesia	150.33	2,146	British
Bechuanaland	294.00	294	British
U. of S. Africa	790.58	12,646	British Dominion; including S.-W. Africa
Basutoland	11.72	555	British; native reservation
Swaziland	6.71	184	British; native reservation
Mozambique	297.65	5,733	Portuguese
Madagascar	228.59	4,464	French

city in the African World, Capetown, Durban, and Port Elizabeth each has between 100 and 600 thousand. The largest cities outside South Africa of European character fall in the 50-thousand class.

REGIONS

It is hardly possible to divide the African World into satisfactory culture realms or regions. The basis of division in the following discussion is political and geographical rather than purely cultural. Lack of detailed studies for the whole African World makes any other basis of separation exceedingly difficult, and available statistical information is grouped by political divisions. To a certain extent the present landscape of each region reflects the activities of the European nation responsible for its development. This point is illustrated by the poorly developed Portuguese possessions on the one side and highly developed British South Africa on the other. However, political division among European powers is too recent for the African World as a whole to serve as a single criterion for delimiting culture regions.

In Table 24 is a combined geographical-political division of the African World into regions suitable for detailed discussion.

GUINEA LANDS

The Guinea lands consist of the twelve listed major political divisions plus insignificant additions such as the Portuguese islands of São Thome and Principe.

These countries are all tropical and in general attain only moderate elevations. The coastal margins are typically mangrove fringed and swampy, with a heavy cover of tropical forest. The exceedingly regular coast line is flanked by offshore sandy beaches behind which are shallow lagoons.

Large, well-protected harbors are few. Dakar is outstanding in this latter respect, being rated the best harbor between Casablanca and the Cape. The Gambia River provides passage for deep-draft vessels for 150 miles inland. Freetown, Sierra Leone, is another excellent harbor, and the same is true of Takoradi, Gold Coast. Between Nigeria and Senegal there are stretches hundreds of miles in length where there is no natural protection for seagoing ships.

A few miles inland there is normally an abrupt rise to a low plateau. At a distance varying from four or five to over two hundred miles the coastal forest gives way to more-open savanna country. Baobab and silk-cotton trees replace the palms and hardwoods familiar in the rain forest. Open grasslands, herds of wild herbivores, and domestic cattle and sheep mark the removal from the tsetse fly-infested forest.

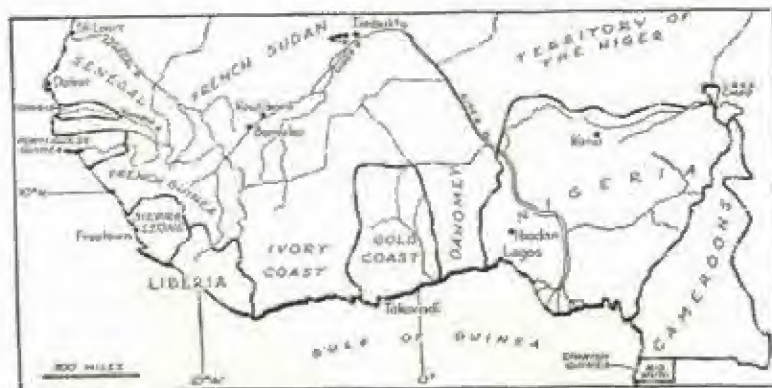
Rainfall is generally abundant to excessive along the coast. However, it is largely seasonal, with a marked summer maximum. During the winter the dry, dusty *Harmattan* wind blows out of the desert and affects the weather nearly to the coast.

The Guinea coast has a bad reputation regarding health conditions. In large part the reputation is deserved. Malaria, blackwater fever, sleeping sickness, yellow fever, dysentery, and typhoid are endemic. Smallpox and meningitis come in severe epidemics. The rapid and marked weather changes of the interior favor pulmonary disorders. Tuberculosis is common among the natives and Europeans are frequently afflicted with rheumatism. Both the dry season and the marked elevation of the interior bring relief, and it has been amply demonstrated that sanitary measures are effective preventives of most ailments.

The density of native populations in the Guinea lands is well above the average for the continent. There are innumerable tribes, especially to the south, and great diversity of native languages. Various *lingua francas* have been adopted to aid

intertribal communication. Of these the most widely used is Hausa.

There is also wide cultural diversity among the native peoples. On the immediate



Guinea Lands and Western Sudan: index map

coasts are tribes particularly proficient as canoe-men. During the early days they were well treated by the slave traders since they were needed to perform lighter service along the harborless coast. Within the forest belt basic native economy is shifting agriculture, while pastoralism becomes important in the open, grassy interior free from sleeping sickness. All native groups still show competence as metallurgists and woodcarvers. Headed by mud-walled Ibadan with its 400,000 inhabitants, there are at least nine native cities in Nigeria with populations in excess of 30,000. Despite long contact with Hamitic and Semitic peoples at the north and with Christian missionaries, particularly near the coast, the Guinea natives remain dominantly Negroid racially and pagan in religion. Distinctive groups are the descendants of liberated slaves, long settled in Sierra Leone and Liberia. In the former the term *Sierra Leones* refers to a mixture of some 150 tribes who speak a pidgin English and are Christians. In Liberia the coastal and politically dominant Americo-Liberians speak English and are also Christian.

White people are relatively few in the Guinea lands: about 5,000 out of over 23 millions in Nigeria; less than 800 of the 2 millions in Sierra Leone; and about 3,000 among the over 4 millions in the Gold Coast. The Europeans are mainly political administrators and supervisors of various commercial enterprises. They are not colonists in the true sense. Granted that diseases can be controlled, it is certain that the climate is not congenial to Europeans. To this generalization there is one exception, the highland plateau of the Cameroons. But, even if the Europeans can control diseases and adapt themselves to natural conditions, it must be remembered that the lands are already occupied, in spots to saturation, by a virile people, the Negroes. The day when natives can be shoved aside by Europeans is likely past.

During the early period of exploitation by Europeans, pepper, rubber, and timber were added to gold, slaves, and ivory as articles of export. When slavery was abolished, the harvest of pepper declined and wild-rubber gathering could not meet the competition of plantation production. Mineral exports likewise dropped in relative importance with the growth of the plantation system. However, the opening of the country to prospecting by modern transportation has ushered in a new period of mineral production. To gold have been added diamonds, platinum, bauxite, columbite, chromite, and ores of manganese, molybdenum, iron, and tin. The future of mining as an important industry is assured.

But agriculture is and will doubtless remain

the primary source of wealth. Native food crops remain what they have been for some time: yams, sweet potatoes, sugar cane, cassava, bananas, with millet and rice in favorable locations. Plantation and commercial-farm crops supply a wide range of necessities for export to temperate lands: peanuts, rubber, palm oil and nuts, kapok, bananas, pineapples, coffee, cacao, ginger, tobacco, kola nuts, and timber, with pastoral products from the grasslands.

Commercial agricultural production is by no means equally divided among the several countries. In Liberia, for example, rubber from the million-acre Firestone plantations amounts to four times the value of all other exports combined. Cacao is nearly as important for the Gold Coast, and peanuts for Senegal.

The Guinea lands are perfect examples of colonial economy. They produce to satisfy European needs. They do not manufacture, but instead provide markets for even the simplest goods, produced in Europe. The European powers seem agreed as to the economic position of their Guinea possessions. With regard to the political and social place of the native resident they diverge widely. France attempts to break down all native governments and customs, with the intention of making Frenchmen of the Negroid inhabitants. There is little or no distinction by reason of color. Britain attempts to preserve native institutions as working devices to be used in administration. There is a segregation of native and European interests, not necessarily to the disadvantage of the former.

The advancement of the various countries in terms of sanitation, education of natives, miles of railroads, and other symbols of European culture are a measure of the progress of the New World Revolution. There is at least a fair correlation between this progress and the identity of the governing European power. In the van are British Sierra Leone, Gold Coast, and Nigeria, and French Ivory Coast. In these colonies railroad and highway building are far advanced, diseases are controlled, and the natives are schooled and their rights respected. Most backward are Spanish and Portuguese Guinea and independent Liberia. These countries are cesspools of outlawed social practices, reservoirs of disease, and museums of the pre-mechanical age. This association of colonial backwardness with Spain and Portugal is no isolated instance, for the same characteristics distinguish their other possessions. The situation in independent Liberia, a country dedicated as a haven for liberated

slaves, is decidedly ironical. Here the minority, composed of Christian, English-speaking Americo-Liberians, holds in virtual slavery the pagan native majority.

Guinea cities, the product of the New World Revolution as opposed to native cities, are ports and trade centers. They are not European as to population, nor are they entirely European in appearance, but they perform the functions of commercial cities. Three are sufficiently large and important to be mentioned. Dakar, 185,000 (10,000 Europeans), is situated on an excellent harbor that has been made a significant naval base by the French and also the administrative center of French West Africa. Freetown, 65,000, is the chief city of productive Sierra Leone. Its excellent harbor is the commercial center for a large territory lying outside the political boundaries of the colony. Lagos, 176,000, is the major port and chief "European" city of Nigeria. It is the coastal terminus of a railroad that reaches 700 miles to Kano, and it is the entrepôt for an extensive area.

WESTERN SUDAN

French Sudan and the Territory of the Niger are both parts of French West Africa. The combined area of slightly over a million square miles falls only partially within the African World. The boundary between Dry World and African World is an irregular line reaching from Cape Verde to Lake Chad that very roughly approximates the parallel of 15° N., with a northern swing to include much of the great bend of the Niger in the African World. Such a division leaves but little of the Niger Territory as part of the African World, and somewhat more of French Sudan.

The combined population of nearly 5.5 millions is in large part resident in the African World, for the northern parts of both divisions lie in the scantily peopled desert. In the main the area concerned falls in the savanna-steppe transitional zone, a region of grasslands and park landscape, of summer rainfall that totals some ten to twenty inches, of a generally warm, dry climate to which Europeans are more adaptable than they are to the coastal rain forests. Two major streams, the Niger and the Senegal, are of great importance because they bring precious water to a semiarid land and also provide transportation during part of the year.

Negroid blood is dominant right up to the desert margins, and the numerous indigenous lan-

guages are lumped in that vaguely understood linguistic group known as Sudanese. The common border of the two culture worlds has long been a battleground between Arab and Negro, Mohammedan and pagan. This marginal area is also the meeting ground of agriculture and pastoralism. In the past the nomadic herdsmen preyed on the agriculturists, bringing about a situation akin to that described for native East Africa. Agriculture has long made use of primitive irrigation to a limited extent.

The Sudan was a major source of slaves. Rival tribes fought bloody wars for the privilege of providing Arab traders with human goods. The weaker tribes sought security by isolation. Depopulation was so marked as to be felt to the present time.

Timbuktu is a border city whose history is replete with incidents of the strife between racial groups, religions, and cultures. The city prospered under the mixed-blood Tuaregs in the eleventh century; it went on to greater heights in the fourteenth and fifteenth centuries under Songhai dominance. At the significant site on the great bend of the Niger converged major caravan routes across the Sahara. Timbuktu became a large city, and a trade center of first rank. It was the prime objective of conflicting groups, and its size and commercial significance rose and fell with the shift of conquering tribes.

Not until the turn of the century did France begin to realize the potentialities of the Sudan. The sections remote from the coast have been slow to develop commercially on account of the paucity of transportation facilities. Still, the natives have been forced to pay head taxes; as a result they have found it necessary to migrate to coastal localities to work. Some of the migration is permanent, so that French developments in the Sudan have actually been hindered by a labor shortage.

Coastal St. Louis and Dakar are connected by rail with Bamako, 125,000, the capital of French Sudan, and Koulikoro, both on the Niger. This middle section of the Niger is navigable for some five months during the winter season. Automobile roads are being gradually extended to bring the interior within easy reach of the coast.

Above Timbuktu on the Niger is an area of promising agricultural development. It is a region of excellent alluvial soils. Irrigation works make available some 2 million acres and can be readily extended to bring 5 million more under cultivation. The Niger here floods during the dry winter, so long does it take for the summer headwater rains to get down the low-gradient, braided stream.

The densest native populations of the Western Sudan are grouped along the Senegal and Niger rivers. This is a token of the importance of water to agriculture, the principal economic pursuit of the area. Peanuts have for some years been a leading crop, and certainly the area can easily produce the cotton needed to supply all the textile mills of France.

Excellent resources for pastoral economy are slowly being utilized. Natives once exclusively agricultural, because of fear of marauding herdsman, are now being induced to venture into the raising of cattle and sheep. These areas, throughout their brief colonial history an economic liability to France, may well become major assets. There is uncertainty regarding mineral resources. So far their exploitation has been unimportant.

CENTRAL WEST AFRICA

The three countries composing Central West Africa, French Equatorial Africa, Belgian Congo, and Angola, have a combined area of nearly 2.5 million square miles, the first two about a million each and Angola about half that much. Of the total population of roughly 24 millions, Belgian Congo has over 15 millions. The other two countries share the remainder about equally. The low average density of roughly 10 per square mile falls to 4 or 5 over large areas and rises to 165 to 300 in Ruanda-Urundi, a region of rich volcanic soils and healthy highland climate. Of the entire population only some 95,000 are Europeans, 60,000 in Angola, 30,000 in Belgian Congo, and 5,000 in French Equatorial Africa.

Central West Africa is centered in the equatorial rain forest, and its drainage is dominated by the vast Congo system. Despite the numerous interruptions of falls and rapids, the system provides a good 6,000 miles of navigable waterways, a decided advantage in a region of extensive, almost impenetrable forests. North of the rain-forest zone French Equatorial Africa reaches through savanna and steppe deeply into the desert, so that much of it lies outside the African World. In the south interior Angola is largely savanna and steppe while the coast falls in part into the desert of southwestern Africa.

Diseases, native and introduced, were formerly not nearly so prevalent as on the Guinea Coast. The opening of the back country has accomplished the spread of sleeping sickness and fevers to interior areas where they were formerly unknown. The scanty European population is concentrated in the healthy highland areas such as Ruanda-Urundi, parts of Angola, and the Katanga region of Belgian Congo.

Central West Africa is naturally rich. Tropical forests offer palm oil, rubber, and timber, and there are diversified and abundant mineral deposits. The potential agricultural production is enormous, even though as yet the commercial output is slight.

The native Africans are not only fewer in number, on the average, but they are also much more primitive culturally than are the aborigines of the Guinea Coast and western Sudan. Racially there are African Negroes, Nilotics, Pygmies, and Bushmen. Economically they are primitive agriculturists, hunters, and fishermen. Languages range from Sudanic, Hamitic, and Semitic in the north, through Bantu, to Bushman in the south. There are no great native cities as in Nigeria, and the general cultural level drops steadily from the Mohammedan, Arabic-speaking pastoralists of the Sudan to the lowly Bushmen of the arid south.

The New World Revolution has been slow to act in this part of Africa. The French were more interested elsewhere in the continent, while Belgium and Portugal lacked the financial means to push developments in their colonies. The stage of primitive exploitation, with its goals in ready riches from slaves, gold, ivory, and the various forest products, was everywhere in Africa an infamous chapter in the history of European-primitive relations. In Central West Africa it was particularly black. The system of large private concessions and forced labor practiced in French Equatorial Africa and Belgian Congo was little better than the actual slavery existing in Angola until recent times.

European development of the countries in more permanent fashion has taken place largely since World War I. The more promising sections lie inland, away from the low, malarial coast. In the interior are the major mineral deposits and the natural conditions most suitable for Europeans. To open the country it was necessary to improve and extend transportation facilities: railways, roads, and airplane routes.

Transportation has become far more effective, even in backward Angola. Mining has developed rapidly while commercial agriculture still lags. There have been strenuous efforts to increase white settlement. The Portuguese have long been fearful of losing Angola to a more aggressive power, but their attempts to divert Portuguese emigration to the African colony have been only moderately successful.

Each of the three colonies has a somewhat different natural endowment and orientation so that

the recent course of cultural development must be separately sketched.

French Equatorial Africa remains poorly developed. From Pointe Noire on the 600-mile-long coast a railroad has been built to Brazzaville on the Congo, but despite this improvement and the construction of hundreds of miles of road, transportation facilities are still poor over most of the country. As a result cultural landscapes remain primitive.

From the coastal regions come timber, rubber, palm oil, and, most important, cacao. In the higher interior are plantations producing coffee, peanuts, and cotton. The pastoral yield is increasing. Mineral resources are little explored, but there are known deposits of copper, zinc, lead, and tin.

Of the several cities, Brazzaville, 84,000, is the largest. Among the others is Libreville, 25,000, founded originally as a home for liberated slaves.

Belgian Congo is the most central and equatorial of African countries. With only twenty-seven miles of coastline, the important Katanga district of the southwest is more accessible from Angolan ports than it is from those in Belgian Congo. Within the colony there are nearly 50,000 miles

of roads, 5,000 miles of railroads, and 14,000 miles of navigated waterways.

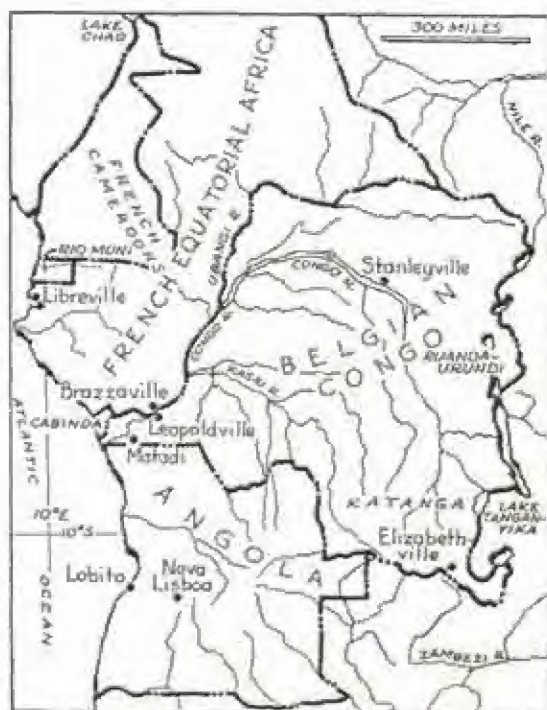
From the Congo forests come palm oil, rubber, and timber, and there is some native production of cotton. But economically most profitable are the mines of Katanga. In 1938 there were nearly 170 mines producing copper, gold, diamonds, cobalt, radium, tin, and iron.

Central among the cities is Leopoldville, 160,000 (8,000 Europeans), 200 miles by rail from Matadi, a deep-water port situated 95 miles up the Congo from the sea. A thousand miles further up the Congo from Leopoldville is Stanleyville, named for the American explorer who did so much to assure Belgian possession of the vast equatorial colony. Center of the Katanga mining region and second only to Kenya as a focus of white settlement in tropical Africa, is Elizabethville. This city is much more closely connected geographically and economically with Rhodesia than it is with the remainder of Belgian Congo.

Angola is a country whose potential productivity is only now being realized. Across the 30-to-100-mile-wide coast plain the awakening Portuguese have built four rail lines to the plateau. The latter, above an elevation of 3,000 feet, has a climate good for Europeans, even to the point of experiencing invigorating frosts during the southern winter. So much more desirable and significant is the plateau over the lowland, that in 1927 the capital of Angola was moved from coastal Loanda 200 miles inland to Huambo, renamed Nova Lisboa, on the plateau. The Angolan railroads provide the best ingress to Katanga and excellent connections with Rhodesia. It is possible, by employing a circuitous route and roads of various gages, to go by rail from Benguela, Angola, to Beira in Mozambique.

Angola is striking in the variety of its resources. The cold Benguela current flanking the coast provides the best fishing in the African World and whaling is important in the same area. In the coast plain are asphalt lakes and unimportant petroleum production. Wild honey and beeswax are significant exports. From lowland to plateau a variety of crops is successfully grown: cacao, sugar cane, maize for subsistence and export, sisal, and coffee. The plateau fulfills all the requirements for an excellent pastoral land. Diamonds are now an important mineral product. Reserved for the future are manganese, copper, iron, uranium, tin, and sulphur ores, and an excellent grade of marble.

Plateau Angola is a "white man's country." To it went many Germans from South-West Africa when the latter territory was mandated to the Union of South Africa following World War I,



Central West Africa: Index map

and in it live the majority of the country's 60,000 European inhabitants.

Aside from the cities mentioned in the discussion above, note must be taken of Lobito, the major port lying on the bay of the same name. Because of its superior harbor, Lobito has virtually replaced fading Benguela as port and railway terminus.

EAST AFRICA

East Africa is an areal concept variously defined by different authorities. As here delimited it includes four countries, all under British control: Kenya, Uganda, Tanganyika, and Zanzibar. Largest of the four units is Tanganyika, with 362,700 square miles; smallest is Zanzibar, with slightly over a thousand. Together the four countries have an area of 682,000 square miles. The total population of 18 millions is divided only roughly in accordance with area, since smaller Uganda has roughly the same population as Kenya, and both are more densely populated than Tanganyika. Higher-than-average continental densities occur in a narrow littoral belt from Mombasa southward and in the Great Lakes region centered around Lake Victoria.

The natural topographic divisions common to the African world are encountered again in East Africa. That is, there is a narrow coastal plain and a plateau. The latter in this area is appropriately termed the Great Lakes Plateau. It has an average elevation of 3,000 feet. Above it rise the highest African mountains, the groups of volcanic peaks dominated by Kilimanjaro, and at the western edge the erosion remnants called the Mountains of the Moon, of which Ruwenzori is the principal peak. A second striking natural feature is the linear depressions of the Great Rift which provide the basins for the great lakes other than Victoria.

Temperatures vary with elevation, from tropical lowlands to perpetual frost on the highest mountains. Rainfall is highly variable, in accordance with differences in exposure. Maximum amounts come in the coast and on the higher peaks. Forest cover is encountered in the coast and on the higher exposed mountain flanks. Areally most extensive are park landscapes, grasslands, and semiarid scrub.

In general East Africa is somewhat more healthy than the regions previously discussed, but malaria and blackwater fever are encountered in the most elevated inhabited areas and severe epidemics of sleeping sickness have occurred on the grassy plains. Even so, the Kenya Plateau and the high sections of northern Tanganyika are by

virtually every natural test "white man's country."

East Africa is racially definitely Negroid. Joined with basic Negroid strains are various degrees of Hamitic admixture to produce the Nilotics and various unclassified mixed breeds. To the southward, especially, sundry Bantu tribes of largely pure Negroid stock represent the aboriginal population. Along the coast are numerous hybrids, the result of long contact with Arabs and other Asiatic peoples. East Africa is the prime meeting ground of old basic agriculture and the pastoralism introduced by invading Hamites. It is also a zone of conflict between Mohammedanism and Christianity in a race to convert the native pagans. In general Islam has been victor along the coast, largely by reason of its early start, and Christianity has been more successful among the inland tribes. The barrier of diversity of native languages has been overcome by the adoption of various *lingua francas*, of which Swahili, Arabic, and English are the principal ones.

Although definitely in the minority numerically, the ruling and commercial groups are non-Negroid, as they are elsewhere in Africa. Oldest of the outsiders are the Arabs, most numerous in Zanzibar and adjacent coastal areas. Indians are by far the most numerous of the non-Africans.

In Kenya, Uganda, and Tanganyika Indians



East Africa: Index map

number some 80,000 as compared with 48,000 Europeans. In Kenya they are largely concentrated in the coastal lowland, but in Tanganyika and Uganda they are not so restricted. Mohammedan Indians early came to East Africa as traders under Arabic auspices. Much European construction was completed by indentured Indian laborers, many of whom never returned to India. With the exception of Kenya, where their activities are legally restricted, Indians largely monopolize trade, urban rental property, and industry, and are important plantation owners. Between them and competing Europeans there is no love lost.

Numbers of Europeans have made East Africa their permanent home, finding in the highlands natural conditions conducive to their good health and financial prosperity. In major part the permanent residents are plantation owners, although many are civil servants, railroad men, or pensioned soldiers. They are most numerous in Kenya, where some 30,000 Europeans are resident. In Tanganyika they number about 10,000, and in Uganda, 7,600. English, Dutch, South Africans, and Germans are most numerous among the Europeans and almost invariably they live in the high country. To the low coastal plain have come in recent years numbers of Greeks and other southern Europeans who can withstand the climate and survive trade competition with the Indians.

Each of the four political divisions represents something of a different approach in political administration. The significant results of the differences are mentioned in the following sections devoted to the individual countries.

Kenya is climatically and governmentally the chief country for Europeans in East Africa. Indians are largely restricted to the lowlands and native lands have been freely alienated for the benefit of Europeans. The Kenya plateau can and does produce nearly every variety of fruit, vegetable, and domestic animal familiar to temperate Europe.

The successful penetration of interior Kenya came after 1903, with the completion of the railroad from the coast to Uganda. The major object in building the railroad was to tap the trade possibilities of the dense native settlements around Lake Victoria. The effect in Kenya of the railroad was to split the powerful Masai tribe in two parts and to provide a base from which European settlements expanded.

In Kenya Europeans have created a landscape more reminiscent of the homeland than is any other outside South Africa. Nairobi, 120,000, capi-

tal and chief city, lies on the cool plateau in a highly productive section. It is a thoroughly modern city where big-game hunters live in civilized comfort while outfitting for journeys into the back country. There are thousands of miles of usable automobile roads. There are plantations and farms worked by semi-forced native labor, yielding the agricultural products that constitute the chief exportable wealth of the colony. American maize or corn, coffee, wheat, sugar cane, sisal, and pyrethrum are grown in close proximity in the equable highland climate. While the country appears to be ideal for the production of high-grade cattle, the results of attempts to raise them have been disappointing.

The need for another source of wealth to supplement agriculture has long been felt. To some extent it has been realized with the discovery of gold. Additional promising mineral deposits are limited to silver and sodium carbonate. Forest resources offer possibilities.

Aside from Nairobi, the principal city is Mombasa, 90,000, the seaport and eastern terminus of the Uganda railroad. By rate manipulation the Uganda railroad has been favored over others competing for the trade from coast to interior. As a result Mombasa has boomed over all rival East African ports to become the chief entrepôt for the region, and so assume the position once held by Zanzibar.

Uganda, smaller but more densely populated than Kenya, has been recently administered with the interests of the native African population held paramount. Native political administrations have been maintained, alienation of land and European settlement highly restricted, and native economy fostered to the extent that the local populace does not find it necessary to migrate to find work.

Lying close to the equator, the country has both low, hot, forested sections and high, dry grasslands. At the west it borders on Lakes Albert and Edward and it includes the northern portion of Lake Victoria, at the south. Within it are the Mountains of the Moon and 17,000-foot Ruwenzori.

From 1879 to 1890 Uganda was a battleground among Protestant, Catholic, and Mohammedan to convert the native population. Severe epidemics of sleeping sickness occurred during the time of the religious conflicts. Native institutions crumbled and chaos prevailed. Not until the able administration of Sir Harry Johnston did the British restore order and prosperity. Competent native dynasties were returned to authority and native agriculture and pastoralism fostered. The railroad was built from the coast, steamer traffic

introduced on the lakes, and many miles of road constructed.

As in Kenya, agriculture is the primary economic pursuit. Some 3 million acres are devoted to the production of food crops. Plantain and millet remain the chief subsistence crops. To them have been added a variety of food and commercial plants: oats, wheat, barley, coffee, cacao, bananas, deciduous and citrus fruits, and plantation rubber and cotton. From cattle, sheep, and goats come exports of skins and hides.

Mineral exploitation has not reached great proportions. Still the area is a major source of tantalum, and produces copper and tin as well.

The chief city and native capital is Kampala, 70,000, while the seat of British administration is charming Entebbe, 7,300, situated on Lake Victoria.

Tanganyika as a trust territory of the United Kingdom is presumably administered in favor of the native population and without prejudice as between European and Indian. Actually the latter stipulation is observed, but there are regulations whereby the natives must work, either for themselves or for non-native plantation owners.

In general Tanganyika is naturally like the other East African countries. A narrow coastal plain is succeeded by a tableland 3,500 to 8,000 feet high. At the higher elevations the climate is European-like, but without marked seasonal variations. Forest is limited and most of the plateau is an open country of grassland and park landscape. To the northeast is the great massif of Kilimanjaro; to the northwest, Lake Victoria. But the country is cursed by the presence of the tsetse fly over three quarters of its area, and malaria is a menace even at the higher elevations.

During the German administration prior to World War I, a railroad was built from the seaport of Tanga to Moshi and Arusha, the chief areas of European settlement at the base of Kilimanjaro. Another line was constructed from the port of Dar-es-Salaam to Kigoma, center of heavy native population on Lake Tanganyika. Since the war the British have built a branch from Tabora on the Dar-es-Salaam line to tap the cotton, gold, and diamond-producing Shinyanga area at the south end of Lake Victoria. They have also constructed 20,000 miles of dry-weather roads and added steamship lines on the lakes.

Under the requirements of the trusteeship, Indians have equal opportunity with Europeans. As a result they dominate the business life and control service industries, rent-property, and plantations. While there has been considerable immigration of Europeans, the number has not been so great as that going to Kenya, where competition with Indians is less keen.

Agricultural products from plantations and native farms remain the principal source of wealth and exports. The leading money crop is sisal, followed by coffee, maize, sesame, and hides. The list of exported minerals includes diamonds, gold, silver, tungsten, and tin.

The capital and largest city of Tanganyika is the port of Dar-es-Salaam, 70,000. In second place among port cities is Tanga, 11,000. Largest of the interior cities is Kigoma, 14,000, terminus of the railroad to Lake Tanganyika.

Zanzibar and the neighboring island of Pemba, together with Mombasa and a 10-mile coastal strip of Kenya are the semi-autonomous remnants of Arabic empire in Africa. In the islands is a heterogeneous mixture of peoples reflecting a varied history. The great bulk of the 264,000 inhabitants are Bantu Negroes, but there are also 33,000 Arabs and 15,000 other Asiatics, principally Indians. Not more than 300 Europeans brave the low, damp, tropical conditions marking the coastal location.

Zanzibar of the independent sultans was the center of the lucrative slave trade of the African east coast. In addition it was the great entrepôt for trade of all kinds, until its replacement by Mombasa within recent years.

With the suppression or diminution of the slave trade early in the nineteenth century, Zanzibar's financial fortunes declined. In 1830 by edict of the sultan it was made compulsory to plant cloves. The "Island of Spices" came to dominate the production of cloves and today still supplies some 80 per cent of world consumption. The only additional item of significant agricultural production is the coconut. Both cloves and coconuts are produced on plantations owned by Arabs and Indians.

Zanzibar, 60,000, the city of the island, is an interesting if unhealthy spot of slowly declining commercial importance.

39: Modern Cultural Landscapes: Southern Africa

Southern Africa is a very general term to include the nine southernmost countries of the continent. Natural unity is largely lacking, since the latitudinal range extends from 8° to 35° S., and elevations vary from sea level to over 10,000 feet. Still, included within southern Africa are the only non-tropical portions of the African World. Much of the area involved is sub-humid to arid, and tropical rain forest is small in extent.

Culturally the region also lacks unity. Among the aboriginal inhabitants are the Malagasy of Madagascar, the Bantu, Hottentot, and Bushmen, each with a distinctive cultural orientation. Yet, in southern Africa the New World Revolution has gone much farther than anywhere else in the African World, and only here do Europeans constitute a vigorous and substantial part of the population.

Politically the region is, with the exception of Madagascar and Mozambique, part of the British Empire. The political status of the seven British countries varies from the native reservations of Basutoland and Swaziland to the independent dominion, South Africa.

In the following sections each political entity is treated separately, with the final sections re-

served for the Union of South Africa, for Europeans the most significant country of the African World.

NYASALAND A small country about the size of Indiana, Nyasaland is tucked away in the interior of the continent, along the western side and around the southern or outlet end of Lake Nyasa. It shows the usual contrasts of lowland and plateau. The plateau, which rises to maximum elevations of 8,000 feet, is divided into a number of sections by streams flowing into Lake Nyasa. The lowlands surrounding the lake and those occupied by streams are hot, damp, and unhealthy. The choice area climatically is the Shire Uplands, the portion of the plateau paralleling the Shire River. Rainfall is normally moderate, which, combined with generally high temperatures, means a dominance of grassland over forest.

Nyasaland was densely populated during pre-European days. It was a major source of slaves, secured by the feared Angoni tribe for Arab traders. British missionaries entered the area permanently in 1875, and the African Lakes Corporation in 1878, both at least in part dedicated to the suppression of slave trade and local wars.

In 1892 the country became a British protectorate.

Modern commercial progress in Nyasaland is directly proportional to the development of transportation facilities. Water transport on the Shire River is an uncertain matter. In 1935 a bridge over the Zambezi at Chindia was completed, effecting a continuous rail line between Lake Nyasa and the port of Beira



Southern Africa; index map

in Mozambique. Within Nyasaland are some 4,000 miles of roads, of which a thousand are available to automobiles.

The economic backbone of the country is agriculture, despite known mineral resources, notably bauxite. The variety of natural conditions permits a range of crops: coffee, of declining importance since the rise of Brazil as a producer; tobacco; maize; long-staple cotton; rice; and tea.

The towns are small. *Zomba*, 7,500, is the capital, situated in the low Shire Valley. *Blantyre*, 6,500, named for Livingstone's Scottish birthplace, is the focal point for most of the 3,820 European residents in Nyasaland, and lies in the healthy, invigorating Shire Highlands.

The European residents of Nyasaland, like those dwelling in the pleasant highlands of Kenya, Angola, Rhodesia, Kantanga, and other parts of the African World, are fiercely loyal to their adopted homes. No Californian or Texan, native or converted, is more genuinely fond of the land in which he lives. In these highland areas there is often a happy relationship between European and black African, even though it is a paternalism resting on strict economic differences. There is little of the direct competition of white versus black proletariat such as clouds the atmosphere in South Africa.

NORTHERN AND SOUTHERN RHODESIA Separate political divisions of the Empire, these countries are commonly associated because both bear the name of Cecil Rhodes, and because they were developed and administered by the British South African Company between 1889 and 1923. Northern Rhodesia is a crown colony, while Southern Rhodesia is a self-governing country approaching dominion status.

The two Rhodesias are separated by the Zambezi River. Of a combined area of over 380,600 square miles, Northern Rhodesia occupies about two thirds. The two are about equal in population, with Southern Rhodesia ahead by 728,000. But the European population of Northern Rhodesia is only 36,000, as compared with 129,000 for Southern Rhodesia. Climatically the former is much less suited to white settlement than the latter, and the progress of the New World Revolution is proportional to natural conditions and the extent of European colonization.

Most of Northern Rhodesia is a plateau, 2,000 to 5,000 feet in elevation, which at low latitudes is not sufficiently high to bring great relief from tropical temperatures. Despite a moderate rainfall and generally open country, malaria, black-water fever, and dysentery are prevalent.

A railroad crosses central Northern Rhodesia

from north to south. Along this line are the bulk of the European population and most of the mines that are the basis of the country's major economic activity. Copper, cobalt, vanadium, and zinc are the principal minerals produced.

Apparently excellent conditions for a pastoral industry cannot be fully utilized because of frequent outbreaks of various diseases. Opinion among some is that only an extermination of disease-carrying game animals can make a sound pastoralism possible. Most important of agricultural products is cotton, a crop well adapted to the climate and soils.

Among the towns and cities are *Lusaka*, 3,000, the capital; *Livingstone*, 10,000; *Ndola*, 12,000; and *Broken Hill*, 10,000; all situated on the railroad.

Southern Rhodesia has the advantage of greater distance from the equator and an accessible plateau section averaging 4,000 to 5,000 feet in elevation. The latter has a rolling surface, is sufficiently well watered, and carries a typically savanna-steppe covering of vegetation. Summer temperatures are moderate and winter frosts are known, altogether producing climatic conditions favorable to the good health and energy of Europeans. The region is endowed with excellent soils and a varied and abundant supply of minerals. Most striking of the natural features are the Victoria Falls of the Zambezi River, high among the scenic features of the world.

Southern Rhodesia contains remarkable monuments in the form of massive stone ruins. The identity and period of the builders are unknown, but presumably they were people of Caucasoid stock who came to Rhodesia to mine gold. The Bantu invasion reached the region about 700 A.D., driving before it the primitive Bushmen.

The British South African Company of Cecil Rhodes not only developed mining in Rhodesia, but also built railroads and roads, and encouraged agriculture, stock rearing, and the founding of a colony of Europeans. Today Southern Rhodesia is one of the highland tropical areas successfully settled by north Europeans. Its white colony of nearly 130,000, largely English, has twice refused to join the Union of South Africa, choosing instead self-government free from the domination of the Afrikaner Dutch.

Maize is the number one crop, followed by wheat, tobacco, citrus fruit, and dairy and pastoral products. Chrome ore is the most significant mineral product; gold, asbestos, and platinum ore are also mined. The region contains one of the best African coal deposits.

Largest of the cities is *Salisbury*, 62,000, the capital, pleasantly situated on the plateau at an elevation of 5,000 feet. Another European-built city is *Bulawayo*, 50,000, the former Rhodesian capital.

BECHUANALAND A large, empty country, Bechuanaland is politically a British protectorate. Slightly larger than Texas, its population density is only one per square mile. A restricted natural endowment explains the sparse population and limited cultural development. At least in large part it is remote and undesirable land, as indicated by the fact that it is the last refuge of the Bushmen.

Bechuanaland is comparatively low, with an average elevation of some 3,000 feet. With fifteen to twenty-five inches of annual precipitation it is not a climatic desert, but the effectivity of the rainfall is much reduced by reason of a sandy, absorbing soil. The northern section of the country has interior drainage; Lake Ngami, the Great Makuri Kau Salt Pan, and Okavango Swamp are centers toward which wet-season streams flow. There is a fair to excellent covering of vegetation for grazing, bunch grass, shrub, and a few trees, but the absence of available water prevents the use of much of it. The winter climate, from May to August, is excellent, but the summers are hot and changeable, and fever is common.

Bechuanaland became a British protectorate in 1885, mainly to provide passage between Cape Colony and Rhodesia without going through the independent and often hostile Transvaal and Orange Free State. Incidentally, it became a sanctuary for its native population of less than 300,000 Bantu and Bushmen. Unquestionably the lack of marked agricultural and mineral resources has kept the European population down, rather than regard for native welfare.

Today Bechuanaland is little advanced in the New World Revolution. A single rail line cuts through its eastern corner. Some pastoral production, a little gold and silver, and the native preparation of wild-animal pelts and skins comprise the commercial economy. There are a number of rather large native settlements; *Serowe*, 30,000, situated about fifty miles west of the railroad, is the largest native city in southern Africa. There is no truly European city, the administrative center, Mafeking, being located across the boundary in Cape Province.

BASUTOLAND AND SWAZILAND These countries are native reservations lying within the

Union of South Africa but politically not part of it. Both are British protectorates, Basutoland since 1868 and Swaziland since the Boer War at the turn of the century. Only a few licensed whites are permitted to live in Basutoland, and there is no alienation of native lands. In Swaziland there are 2,000 European concessionaires who control about two thirds of the land. Both countries owe their existence to British protection against conquest and absorption by Europeans.

Swaziland occupies three levels of the Bushveld plateaus, ranging from 1,000 to 4,000 feet in elevation. It is mainly an open grass- or bushland of invigorating climate, free from malaria. Its excellent deposits of tin, gold, and asbestos are mined by Europeans.

Hereditary chieftains are the actual rulers of the country. On the land reserved for native use there is considerable production of cattle and a wide range of crops. The amount of this land is insufficient to satisfy all native needs, so that there is a considerable migration out of the country to seek work. Europeans, in addition to controlling the mines, specialize agriculturally in cotton and tung orchards. Swaziland lacks railroads but has sufficient road mileage to serve the country's needs. Towns are small and unimportant, *Mbabane*, 2,000, being the largest.

Basutoland, like Swaziland, is high and has an invigorating "white man's" climate. Rainfall is moderate, and the grassy surface is ideal for grazing. Due to the prevalence of frost and seasonal aridity, not more than half the country's area is safely cultivable. Small farms on the communally held land produce mainly subsistence crops, maize and wheat. Wool is the principal commercial asset, since there is no mining. Basutoland is a large supplier of labor, especially to mining activities in the Rand district.

Basutoland has but one mile of railroad and few roads. There are no large towns or cities. Mosem, the capital, being nothing more than a camp.

MOZAMBIQUE The very large Portuguese colony, Mozambique, is named for a small island lying off the coast in Mozambique Channel. To this area the Portuguese have had a claim since the fifteenth century, and they have fought Arab and Zulu to hold it. In the seventeenth century the Portuguese brought Indian traders to the east coast of Africa, so introducing what is now an important racial and cultural group.

Mozambique is unusual among southern African countries in the greater breadth of its coastal plain and in the possession of a great

delta, the Zambezi. Back of the mangrove-girt coast plain is a two-level plateau, averaging 2,000 and 3,500 feet in elevation. The lowland is generally wet, forested, and fever ridden. The upland surfaces are more open and decidedly more healthy. The colony is enormously rich in agricultural resources. It has tropical woods as well, and mineral wealth, although the latter, notably coal and gold, is slow to be developed.

First European interest in Mozambique was gold; the second, slaves. Lack of commercial progress led to the opening of the country to foreigners in the seventeenth century. As a result, Indians gained trade control that they have never relinquished. Between 1833 and 1895 the Zulu drove the Portuguese out of the country south of the Zambezi. Subsequently the dense Negro population has been a rich source of labor for British possessions, and a resource to be exploited by successful bidders for the privilege.

No small portion of Mozambique's prosperity derives from its favorable geographical position. Its 1,350 miles of railroads and 17,000 miles of roads, largely financed by foreign capital, serve as outlets and inlets for the Rand district of South Africa, Rhodesia, Nyasaland, and even Belgian Congo.

Tropical woods are an important export, but in general the excellent pastoral and even greater agricultural possibilities are barely scratched. Sugar cane, peanuts, tea, cashew nuts, coconuts, sisal, maize, and cotton are but a few of the crops that have been successfully grown.

There are two major cities, each a busy port and terminus of a railroad reaching the southern interior of the continent. *Beira*, 35,000, is the port for Rhodesia, Nyasaland, and Katanga. Despite its coastal position it is largely free of mosquitoes and hence of malaria. *Lourenço Marques*, 68,000, is a major outlet for the Rand district of Transvaal. It contains about half of Mozambique's 45,000 Europeans, and a large percentage of the equal number of Indians and other Asiatics.

MADAGASCAR Madagascar is one of the world's largest islands, off a coast that is generally isleless. Its insular nature is borne out by many natural and cultural characteristics. It has a trade-wind climate, so that its exposed, steep eastern side is rain forest, while its sloping-plateau, western surface is savanna. Both flora and fauna are quite un-African, showing many resemblances to South America. Culturally Madagascar is also non-African, exhibiting basic similarities to Malaysia. Even in modern commercial relations, Madagascar remains largely outside the African orbit.

Although the Portuguese were the first Euro-

peans to enter Madagascar, there was a 30-year period of French occupation around the middle of the seventeenth century. France proclaimed a protectorate over the island in 1885 and completed its military conquest ten years later. The period of modern development began with the more-recent French occupation. Roads, railroads, canals, and modern cities mark the advanced progress of the New World Revolution.

Some 3 million acres, native and plantation cultivated, produce a variety of crops for subsistence and export: rice, cassava, sugar cane, beans, sweet potatoes, vanilla, maize, cloves, bananas, coffee, coconuts, and cacao. To these are added pastoral products from the grazing lands of the interior plateau. Forest products include timber, raffia, and tanbark. Mining has not been pushed, but it yields graphite, mica, quartz crystals, radium, and phosphate.

After a period of depopulation during the days of slavery and forced labor, the racially mixed native population has generally increased, the surplus slowly occupying the semivacant lands on the western side of the island. The native majority is Christian, skilled agriculturally, and generally advancing under the French regime.

Tananarive, 171,000, is a modern city and the capital, situated at an elevation of 4,000 feet near the eastern side of the island. Its fine climate holds a large proportion of Madagascar's considerable number of European colonists. *Tamatave*, 30,000, is the capital's port on the Indian Ocean. *Diego-Suarez*, at the extreme northern tip of the island, has been used principally as a French naval base.

UNION OF SOUTH AFRICA

The Union of South Africa is an independent dominion of the British Commonwealth made up of four semiautonomous provinces: Cape of Good Hope, Natal, Orange Free State, and Transvaal; and a mandated territory, South-West Africa. Total area is over 0.79 million square miles, and total population of about 12.6 millions, or an average density of about eighteen persons per square mile. Of the aggregate population, over 69 per cent are Negroes, about 21 per cent Europeans, and the remainder is divided in the main between Indians, and "colored" or mixed bloods.

Of the natural setting of South Africa, the areally dominant land form is the plateau. The most conspicuous individual feature is the outward edge of the plateau, a seaward-facing es-

escarpment, varying in distance to the coast from 250 miles on the eastern side of the continent to 50 miles in South-West Africa. The crest of the escarpment is the highest part of the plateau in the south and east, where it reaches maximum levels of 10,000 feet and is referred to as mountains: the Drakensberg, Stomberg, Komsberg, and others, in different localities. In this area of widest coastal plain the crest is reached in a series of steps rising from the sea. North of the Cape the steps are folded mountains. Between the low mountains are longitudinal depressions or troughs named the Little Karroo and the Great Karroo. From maximum elevations at the escarpment crest the plateau level drops off toward the interior and westward. Toward the northeast, for example, the High Veld drops off to the Bushveld, and the latter to the Low Veld of the Transvaal. Although the plateau is generally lower on the western side of the continent than it is on the eastern side, there is an important exception in central South-West Africa. There the plateau level rises in an isolated mass to over 5,000 feet, and provides the major sites habitable for Europeans.

The significant matter of climate has been discussed in some detail in a previous section. It should be recalled that rainfall reaches a maximum at the escarpment rim around the eastern and southern border of the continent, and falls off rapidly westward. The important isohyet of 10 inches annual precipitation runs in a north-south direction about midway between the east and west coasts.

Temperatures show the expected low range along the coast and a much greater one in interior locations. Except for the immediate coast and the lowlands of northeastern Transvaal, there is likelihood of winter frosts, and, for that matter, even in summer, in the High Veld. The southeastern humid subtropical and southern Mediterranean climates are largely marine and equable, while the interior and west coast are continental climatically, and practically, faced with the problem of deficient water supply. True forest is exceedingly limited, and for the most part the vegetation is variously grassland, park landscape, scrub, and barren desert.

The European settlers who were moving into the interior during the eighteenth and nineteenth centuries met the advancing Bantu, who were not only fighting among themselves but also pushing the Hottentot and Bushmen into the least desirable sections of southwestern Africa. The pioneering Dutch Boers, always outnumbered by their Negro

adversaries, to win the wars had to utilize fully the advantages of horses and firearms.

The initial advance from the Capetown base was slow. Mariners had to be converted into farmers and pastoralists. In 1682, thirty years after the founding of the Cape settlement, Europeans numbered only 700. Following the configuration of the land and the distribution of rainfall, the direction of expansion was to the east and northeast. In 1688 there arrived a party of several hundred French Huguenots. Although they soon lost their identity among the dominantly Dutch settlers, the Huguenots firmly established viticulture as a significant part of South African agriculture.

For a hundred years the expansion of the colony was slow. In 1795 Europeans totaled only 20,000. The great movement inland to the High Veld country was initiated by political changes. At the conclusion of the Napoleonic Wars, the Netherlands sold Cape Colony to the British. In 1820 the first English settlement, Port Elizabeth, was founded. The abolition of slavery in 1833 caused an open break between Boers and British. Groups of Boers moved eastward out of Cape Colony to found Natal and its port, Durban, but in 1842 the British occupied the new state.

In 1836 came the famed Great Trek. Ten thousand Boers, finding conditions under British rule intolerable, packed their possessions in ox wagons and moved northward across the Orange River onto the High Veld. There they defeated the military Zulu Bantu and, reinforced by more Dutch colonists from Cape Colony, pushed on across the Vaal. In 1852 the British acknowledged the independence of the Dutch South African Republic, composed of Orange Free State and Transvaal. There, on the high windswept plains, the Boers became a thoroughgoing pastoral people, expanding ever onward to the climatic limit of grazing.

Diamonds were discovered on the Orange River in 1867. There was a great rush of miners and prospectors to South Africa. With the discovery of diamonds in volcanic pipes, the industry became concentrated around the city of Kimberley, just over the boundary from Orange Free State in British Cape Colony. Even more fateful for the fearful Boers was the discovery of gold in Transvaal in 1884. Preliminary finds had been made elsewhere in both British and Dutch territory, but the new strike uncovered the greatest of the world's gold fields, the Witwatersrand or Rand, on which Johannesburg is now situated. Drawn by the lure of gold were thousands of stampeded, mainly of British stock, who soon outnumbered the Boers two to one.

The Boers resented the newcomers and they thoroughly disliked the mining that disturbed their

pastoral ways. Friction was inevitable, and the final consequence was the Boer War of 1899-1902, in which the Boers after early successes were eventually defeated by the might of the British Empire. Absorption of the Dutch republics into the empire but temporarily submerged the Boers politically. The inevitable effects of a superior birth rate and liberal empire policy have restored them to political dominance in the whole Union.

Three striking and significant matters characterize the South Africa of today: the nature of its economy; the composition of its heterogeneous population; and the progress of the New World Revolution, particularly as expressed in urbanization, industrialization, and their associated phenomena.

National economy is too dependent upon mining for its own good health. South Africa supplies something like 35 per cent of the world's gold production. The workers in this single mining industry number over 360,000, or 82 per cent of those gainfully employed in the whole country. Gold mining is concentrated in the Rand, a great reef seventy miles long lying on either side of Johannesburg, the "Golden City." Individual mines now reach a depth of 7,700 feet. Expert opinion indicates that the peak of production has been passed and that serious decline is only a matter of time. However, recent discoveries in other areas may enable South Africa to maintain its rank as the leading gold-producing country.

The Union, once the premier producer of diamonds, has now fallen to an annual yield of only 4 to 10 per cent of the world total. The deep mines at Kimberley and Pretoria are closed, and the center of placer production has shifted to Belgian Congo. Recent placer discoveries may raise the Union's position as a producer, but return to monopolistic control of the world supply seems quite impossible.

Of other mineral production, coal is by all means the most important. In a continent poor in mineral fuels, South Africa is outstanding in having an abundant supply of good-quality coal. It is found in the Karroo rock series paralleling the coast in Cape Province and Natal, and also in Transvaal. There is bituminous coal of coking quality and even some anthracite. During the war years the Union exported coal to South America and other fuel-poor areas. Since petroleum and water-power resources in South Africa are negligible, the coal supply is especially significant.

Of industrial metals, copper is the most important. Abundant if not the richest iron ores, platinum, and tin are among a list of metals and non-metals that assures the nation a reasonably

well-rounded mineral supply. Certainly, with the resources of adjacent British possessions, South Africa's industrial future will not fail because of inadequate minerals. However, the present economic dependence upon mining, especially of gold, lays the country open to disaster when mines decline or the world changes its monetary standard. Further, mining tends to discourage the development of agriculture and the arts upon which a nation's health and well-being must be based.

South Africa is a world source of food mainly because it is a large country with a relatively small population. Most extensive of agricultural pursuits is pastoralism, with vast cattle and sheep ranges, especially in the drier portions of the country, producing meat, wool, and hides. Yet only in recent years has the country become an exporter of beef. In fact, imports of beef from surrounding countries have been common in the recent past. Numerous livestock diseases are endemic, and the Afrikaner humped breed of cattle does not produce the choicest meat. Stringent control measures and the importation of well-bred European bulls have largely remedied the situation.

At the turn of the century South Africa imported dairy products annually to the value of nearly 2-million dollars. The introduction of European dairy breeds initiated a new industry, and now exports amount to some 4-million dollars yearly. The rearing of sheep has likewise undergone radical changes. The original stock is a hairy, long-eared, fat-tailed variety, of relatively small value as a commercial meat or wool producer. Crossing with introduced British and Dutch breeds, and especially with merinos from Spain and Australia, has elevated South Africa to an important position among world sources of wool and mutton.

Cultivation utilizes a small proportion of the total area, hardly more than five per cent. In part this is a reflection of the dryness of much of the country and the impracticability or lack of development of irrigation. In part it is due to the traditional Boer liking for stock and reluctance to farm, a trait just the opposite of that exhibited by the British farmers of Cape Province and Natal.

Three areas, the coastal Cape Province, Natal, and the High Veld of Orange Free State and Transvaal, illustrate three distinct types of agricultural production, in part climatically determined. The coastal Cape Province, particularly the Mediterranean section, concentrates on the crops typical of the climate the world over: grapes and wine, citrus fruits, wheat, and tobacco. Natal is predominantly humid subtropical in climate. Maize is a

primary crop at higher elevations, but in the warm, humid coast, sugar cane, tea, citrus fruits, wattle bark, and other tropical and semitropical crops are the rule. The High Veld of the Orange Free State and Transvaal is in many respects the best farming area of the nation. Maize or "mealies" has been since its introduction in 1880 the principal crop, particularly in the eastern humid area, giving way to drought-resistant native Kafir corn in the drier west. Maize is food for animals and Negroes, but for Europeans has never replaced wheat as a breadstuff. From the High Veld come other grains, dairy products, the better meat from fattened animals, and wool. It is notable that methods of agriculture and overcrowding, especially in areas of native farming, have led to widespread erosion and soil depletion, results so commonly associated with commercial agriculture in other parts of the New World.

Bantu Negroes are now and likely to remain the most numerous element of the population. They constitute over 8.5 millions out of the total population and there is little reason to believe that the ratio will change against them. The bulk of the native population lies in the eastern part of the nation, where the Boer pioneers first encountered the aggressive invading Bantu. The Hottentot of the west are fading rapidly. The natives in some cases preserve a semblance of tribal organization and aboriginal culture on land reserved to them. Others are thoroughly detribalized and occupy an economic and social position resembling that of the southern Negro of the United States fifty years ago. The economic opportunities open to natives are restricted, their lands are limited in proportion to their numbers, and little provision is made for their education or improvement in other respects. Yet the vital place of the Negro is apparent in a country where it is against custom for a white man to engage in manual labor. The matter of White-Negro relations in all its various aspects is probably the most serious of the several grave social problems facing South Africa today. Greater economic opportunities for the majority group seem absolutely necessary to a permanently satisfactory solution.

The 2.5 million Europeans have their own internal problem in rather fundamental differences between Boer and Englishman. Some of the differences are based on language and traditional rivalry. Others derive from the common feeling of antagonism between city and country dwellers. Today the Boers are about 60 per cent of all Europeans, and a high birth rate assures a future relative growth in their favor. Europeans of British stock

are most numerous in the Rand mining region, in the port cities, and generally in the province of Natal. The distribution and use of Afrikaans (Dutch) and English, the two official languages, are indicative of the rural-urban relationship between Boers and British. Afrikaans is the native tongue of 41 per cent of the city dwellers, while 84 per cent of rural whites use the same language. The greater natural increase of Boer over British stocks is everywhere evident in the invasion by country-bred Dutch of English strongholds.

Europeans are generally united in a common stand against the expansion of yet another racial group, the Indians. Many of the latter are African born, the descendants of laborers brought to Africa by Europeans. Indians are most numerous in Natal, where their number equals that of Europeans. They are also important groups in the Rand and northern Transvaal. The Indians are regarded as a menace by Europeans largely because they are worthy economic competitors. They are traders and land owners, where not prevented by specific restrictions.

Another social class is represented by the Cape Coloured, largely various mixtures of European and Negro. They are most numerous in Capetown and western Cape Province, an area where there were never Bantu in any number. The half-million Cape Coloured are no economic rivals of the Europeans, but rather are valued as agricultural laborers and house servants.

A small but distinct group are the Cape Malays, some 10,000 in number, hardly to be found outside Capetown. These descendants of Malay slaves, brought to South Africa in the early colonial days, are also no economic threat and are generally well spoken of as servants and laborers.

With the last few decades the existence of a low-order social and economic class, the Poor Whites, has been recognized. The Poor Whites now make up from one tenth to one twelfth of all Europeans, and they pose problems quite as difficult as those accompanying any other group. Their ranks are recruited largely from rural folk, landless or virtually so because of the fractioning of farms among heirs under the Roman-Dutch system of inheritance. The landless farmer cannot labor for the more fortunate in the country, for such is "Kafirs' work." So he drifts to the city, and there he has no recourse but to compete with the native on the unskilled labor market. Yet one explanation of the Poor Whites has it that they are not merely economic unfortunates, but are rather a segregation of the Europeans debilitated by the effects of a subtropical climate!

The Poor Whites are merely a phenomenon accompanying a marked increase in urbanization

that has come without apparent economic cause. Since the first decades of the present century rural depopulation has been notable, especially in Cape Province and parts of Orange Free State. The drift of rural population to cities has not been a response to industrial demand for labor. The move seems not to be explicable in terms of technical changes, but rather is akin to a widespread tendency that is particularly striking and difficult to understand in many parts of the New World. Perhaps people are willing to accept what is often a lower standard of living in exchange for the supposed advantages of city life.

The extent of urbanization in South Africa is approached by no other region of the African World. There are five cities of over 100,000 each. Eleven cities have a combined population of over 1.5 millions, or nearly 14 per cent of the grand total for the Union. This is hardly necessary in a nation where mining and agriculture are the primary economic activities.

Johannesburg, 912,000, "The Golden City" of the Rand is the largest city of South Africa by a wide margin, and on the continent is matched or exceeded only by the cities of Egypt and Barbary. The gold mines of the Rand are the reason for the city's existence. It has become a primary transportation point, and in the event of a decline

in mining would remain the center of a rich agricultural district.

Germiston, 85,000, is one of a number of cities that adjoin Johannesburg along the strike of the Rand gold fields. Together the several cities so situated are the principal focus of urbanization for South Africa.

Pretoria, 292,000, the official capital and actual administrative center of the Union, holds its position as a concession to Dutch sentiment. The city is named for the Boer leader, Pretorius, whose military skill defeated the Zulu during and after the Great Trek. Pretoria lies at the point where the High Veld descends to the Bushveld, and so has climatic conditions less favorable to Europeans than those of the Rand. Pretoria has been in the past an important diamond-mining center.

Capetown, 572,000, is the site of the oldest European settlement and seat of the legislature of the Union. It has an excellent harbor, but it is offside with respect to the productive Transvaal areas. Capetown is the center of the distinctive and productive Mediterranean region. Its climate is described in the glowing terms generally reserved for southern California. Once a largely Boer city, Capetown is predominantly British at



Johannesburg, gold fields (American Geographical Society)

the present time, although a return to Boer dominance seems assured.

Durban, 475,000, is the Dutch-founded but now thoroughly English port and chief city of Natal. Durban is the principal port for the Rand and the primary outlet for South African coal.

Port Elizabeth, 146,000, is the oldest English-founded settlement in South Africa and remains a thoroughly British city. The harbor is of indifferent quality, and the principal business enterprise is the assembly of automobiles imported from overseas.

East London, 30,000, is another in the chain of predominantly British cities extending from Capetown to Durban.

Bloemfontein, 75,000, lies on the old railroad line north from Capetown, in a good agricultural district. It is the capital of Orange Free State.

Pietermaritzburg, 55,000, is the capital of Natal. It is an inland city on the railroad from Durban to Johannesburg.

Kimberley, 45,000, was once the world center of diamond mining. Now, with the closing of the mines, Kimberley is losing population, particularly the European elements.

Walvis Bay, 2,000, is an excellent and the principal harbor on the coast of South-West Africa. A rail line runs inland. Along the coast are whaling grounds and the most important fisheries of South Africa. South along the coast in the vicinity

of Luederitz Bay are important sources of placer diamonds.

Windhoek, 24,000, is the capital of South-West Africa. The city is located on a productive plateau, isolated by severe deserts on either side. The principal utilization of the plateau is the grazing of goats, sheep, cattle, and horses. Windhoek, typically German in appearance, is connected with the coastal ports by rail.

South Africa, unlike most parts of the African World, is a modern country well along on the course of the New World Revolution. Its cities are like those of Europe. Its railroads have an aggregate mileage of over 13,900, and there are 100,000 miles of automobile roads. There are five universities and five additional colleges. The country has produced its quota of eminent artists, statesmen, and scientists.

If South Africa has its difficult problems, it is not unique in this respect. The basic solution seems to be economic, and the answer to the economic requirement may well be industrialization. In the past the Union has been dependent industrially. During World War II there was an abrupt change, and the Union attained major industrial production almost overnight. The range of manufactures now extends from shoes and textiles to iron and steel. The feat is a demonstration of what can be done. South Africa has the raw materials and the manpower. The future is a matter of sound human judgment and determination.

ORIENTAL WORLD

40: Asia

The land area of the earth totals about 57.5 million square miles, of which 36.6 lie on the seven conventional continents: Asia, 16.494; Africa, 11.529; North America, 9.364; South America, 7.097; Antarctica, 5.363; Europe, 3.781; and Australia, 2.975. The Afro-Eurasian landmass thus contains 31.8 million square miles, or about 55 per cent of all land. Asia itself accounts for about 29 per cent of the earth's land. Its area is about equal to all land in the western hemisphere. The parts of Asia outside of the Soviet Union are only slightly smaller than Africa.

The Asiatic mainland is somewhat rectangular in shape, extending about 5,300 miles north-south and 6,000 east-west. Cape Chelyuskin lies in 77° 35' N. Cape Bulus, near Singapore, and most southerly point on the mainland, lies in 1° 14' N. The mainland thus misses the equator by roughly eighty miles. Cape Baba Burun, just south of the Dardanelles, is in longitude 26° 7' E., and Cape Dezhneva (East Cape) in 170° 0' W. On the day of an equinox, when the sun stands directly over the equator, sunrise in easternmost Asia is 10 hours, 48 minutes earlier than in westernmost Asia Minor, 161° 53' of longitude away. Asia is about three times as wide as the distance between the coasts of South Carolina and southern California.

The great latitudinal range of the mainland of Asia is equivalent to that between Cape York, in northwestern Greenland, and the mouth of the Amazon, in Brazil. The East Indies are bisected by the equator and extend to 10° 45' S. Batavia, Java, is in the latitude of the widest part of South America, between northern Peru and eastern Brazil. Equivalents of a selected number of places in Asia and the Americas are given in Table 25.

The coastline of Asia is intermediate between the simplicity of Africa and complexity of Europe. Over half of it is comparatively unused and offers little to render it potentially valuable. The main maritime coasts are in the south and east. These trend at approximate right angles, one side extending from Singapore to Karachi and the other from Singapore to Tokyo. A globe brings out a rather remarkable fact concerning Asia's east coast; it is practically a straight-line continuation of the western coast of the Ameri-

Table 25 Places in Asia and the Americas with similar latitude

Verkhoyansk	Great Bear Lake, Canada
Okhotsk	Seward, Alaska
Khabarovsk	Anticosti Island, Canada
Ulan-Bator-Khoto	Seattle, Wash.
Harbin	Montreal, Canada
Peiping (Peking)	Camden, N.J.
Shufu	Reno, Nev.
Tokyo	Raleigh, N.C.
Nagasaki	San Diego, Calif.
Shanghai	Brunswick, Ga.
Delhi	San Antonio, Tex.
Foochow	Ft. Lauderdale, Fla.
Hong Kong	Camaguey, Cuba
Bombay	Vernacruz, Mexico
Hue	Tehuantepec, Mexico
Manila	Guatemala, Guatemala
Cholon	Port of Spain, Trinidad
Colombo	Georgetown, Brit. Guiana
Singapore	Northernmost Ecuador

cas. The shortest route between Panama and Tokyo passes through Corpus Christi, Texas; Salt Lake City, Utah; Seattle, Washington; and skirts the Aleutian and Kuril (Chishima) islands. Most maps obscure such global relationships because there is no possible way to represent a spherical surface on a plane without introducing distortions.

Another remarkable thing about the east coast of Asia is its island arcs, several great festoons that more or less enclose a series of seas. Bering



Eurasia and America; comparative latitudes and areas

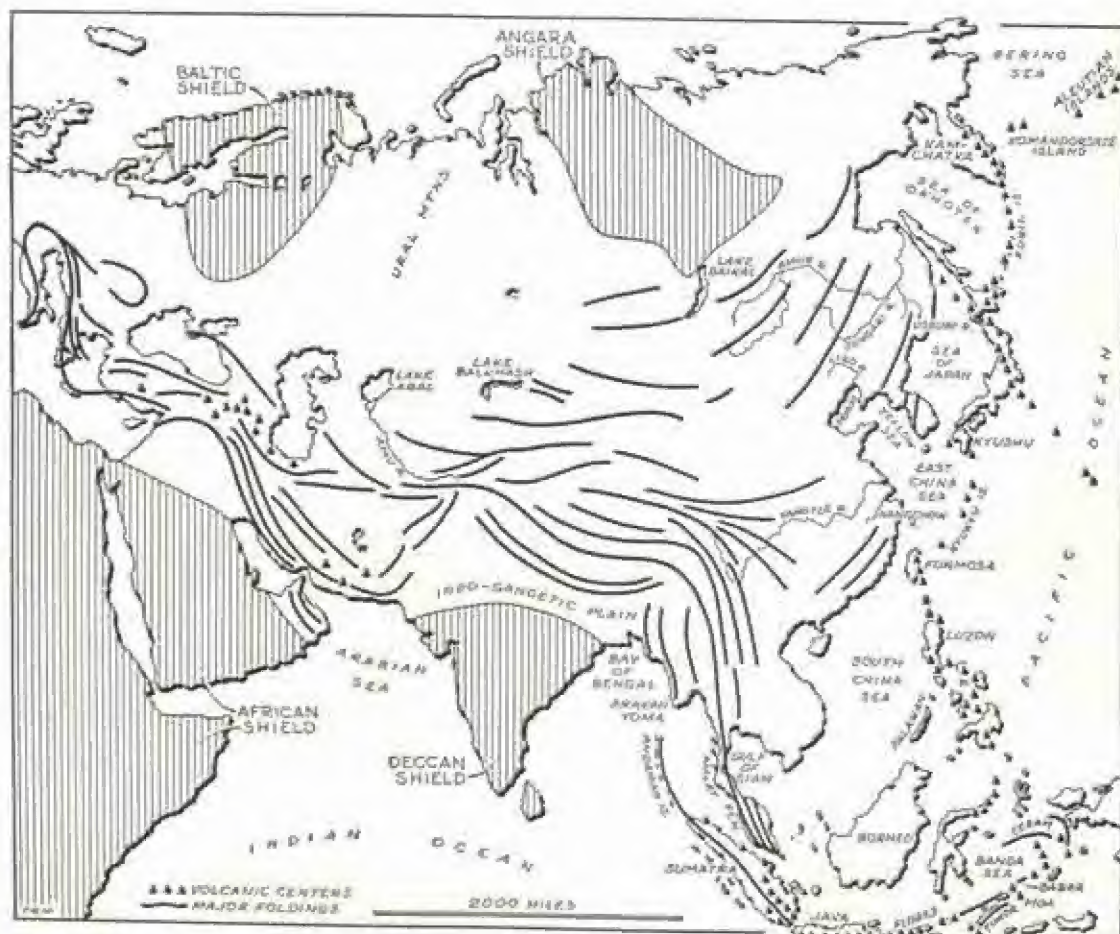
Sea lies behind the arc of the Aleutians and Komandorskie Islands. The Sea of Okhotsk lies behind Kamchatka Peninsula and the Kuril Islands. The Sea of Japan is almost isolated by Sakhalin and the major Japanese islands. The Yellow and East China seas are less adequately sheltered by the Japanese island of Kyushu and the Ryukyu Islands. The South China Sea lies behind Formosa (Taiwan), Luzon, Palawan, and Borneo, on the east, and the Malay Peninsula, on the west.

An East Indian system of festoon-islands starts on the mainland with the Arakan Yoma of western Burma, continuing through the Andaman Islands to Sumatra and islands along its west coast, Java, and other islands east through Flores, Timor, Moa, and the Babar Islands. It then swings northward in a semicircle to Ceram and Boeroe, around the comparatively deep Banda

Sea. Within the East Indies are some extremely interesting and complicated patterns of geologic structures which are associated with active folding and volcanic activity.

The girdle of fire, a volcanic belt that extends around the borders of the Pacific, is a comparatively linear zone running from South America through the island arcs of Asia's east coast and on to New Zealand. A majority of the world's active volcanoes occurs along this belt. A second great volcanic zone extends from the main East Indies arc along the trends of southeastern Asiatic mountains into the ranges of the east-west Eurasian mountain barrier. Asia thus shares in both of the main zones of today's major volcanic activity.

There are high mountains, mainly of volcanic origin, in scattering parts of the world, such as the great peaks in eastern Africa, the volcanic islands of the Pacific Ocean itself, or the mountains of Iceland, but the great concentration of



Asia: geologic structures and volcanoes

highlands lies either along the Pacific girdle of fire or the east-west Eurasian mountain barrier. These mountains are high because they are growing rapidly. Associated with geologic growth are many major catastrophes for man, in the form of volcanic explosions and violent earthquakes. Table 26 brings out the relationship between earthquakes and the two principal belts of mountain growth. It attempts to list all earthquakes known to have resulted in at least 10,000 deaths.

Earthquakes killing a great many people are not necessarily those that actually accompany the greatest displacements or that release the most energy. Many extremely severe earthquakes have resulted in no deaths whatever and some rather minor ones have killed many, because they happened to occur in places with dense populations and poorly constructed buildings. Whatever be the criterion used to group earthquakes, however, one major fact will always appear; most great earthquakes occur either around the borders of the Pacific or along the belt from the East Indies to Iberia.

The average elevation of Asia exceeds that of the other inhabited continents: Asia averages about 3,000 feet above sea level; North America, 2,000; Africa, 1,900; South America, 1,800; Australia, 1,000; and Europe, 980. The ice plateau of Antarctica is supposed to have about twice the average elevation of Asia, or 6,000 feet. Asia's great elevation is due to its extremely high plateaus and mountains along the east-west barrier and northeastward across eastern Siberia. High average elevation is an expression of great seismic (earthquake) and other geological activity. As a rule, high elevations are hostile to dense population and use of land by man. Europe, with its extensive lowlands, is in that respect the most favored continent.

Roughly one half of Asia consists of mountain or high plateau country and about 8 per cent is over 10,000 feet above sea level.

Folded, faulted, and crumpled bedrock is characteristic of most of the mountain chains along the east-west barrier and also along the Pacific coast. Many volcanic peaks rise above the folded

bedrock. These are extremely young features from a geological standpoint. The folded rocks may be of any age whatever, but their present positions are among the latest results of major geological activity, starting well before the Ice Age and continuing to the present day.

Three main Asiatic regions of very old rocks have had an extremely uneventful geological history: (1) in eastern Siberia, (2) the Deccan Peninsula of India, and (3) Arabia. Part of eastern Siberia is a *shield*, or region of ancient rock that has remained unfolded for an extremely long time. There is a similar shield in North America, bounded on the south by the Gulf of St. Lawrence, the Great Lakes, and the whole line of large lakes that runs northwestward through Canada toward the delta of the Mackenzie River. Most of Africa south of the Sahara is similar in having escaped geologic activity to a very great degree for a large part of geologic time. Arabia is part of this African shield, separated by the relatively narrow Red Sea graben. It is possible that the Deccan is a fragment of the same original landmass. Several lines of evidence suggest that at an early time in geological history a continent, Gondwana Land, existed and that it split into several parts, one of which became attached to southern Asia (the Deccan) and another became the main part of Africa and Arabia. It is supposed that this fragmentation was a result of *continental drift* of materials such as continents are made of, mainly granite, over materials such as floor the deeper oceans, mainly basalt, a heavy, iron-rich lava. Whether this has been the history or not is of little concern in the present discussion, but the geographer is interested in the fact that the Deccan, Arabia, and much of Africa are so similar to each other and so different from the east-west mountain barrier to their north. Whether the drifting of the Deccan toward the shield of interior Asia had something to do with the folding and crumpling of the east-west mountain zone is a matter of interest in geological speculation and theory, but the geographer is more concerned with the contrast between regions of relatively unfolded

Table 26 Earthquake disasters grouped according to countries
Year (thousands of deaths)

Portugal	Italy	Asia Minor ¹	India	China	Japan	South America
1755(60)	1915(39)	1939(23)	1935(60)	1932(70)	1923(143)	1875(16) Colombia
1531(30)	1908(75)	1822(22)	1737(300)	1920(180)	1896(22)	1868(70) Peru
	1783(50)	1667(80)		1556(830)	1828(30)	1797(41) Ecuador
	1693(60)	1268(60)		1290(100)	1293(30)	
		856(45)		1057(25)		
				1038(23)		

¹ Included are earthquakes in Turkey, Persia, and Greece.

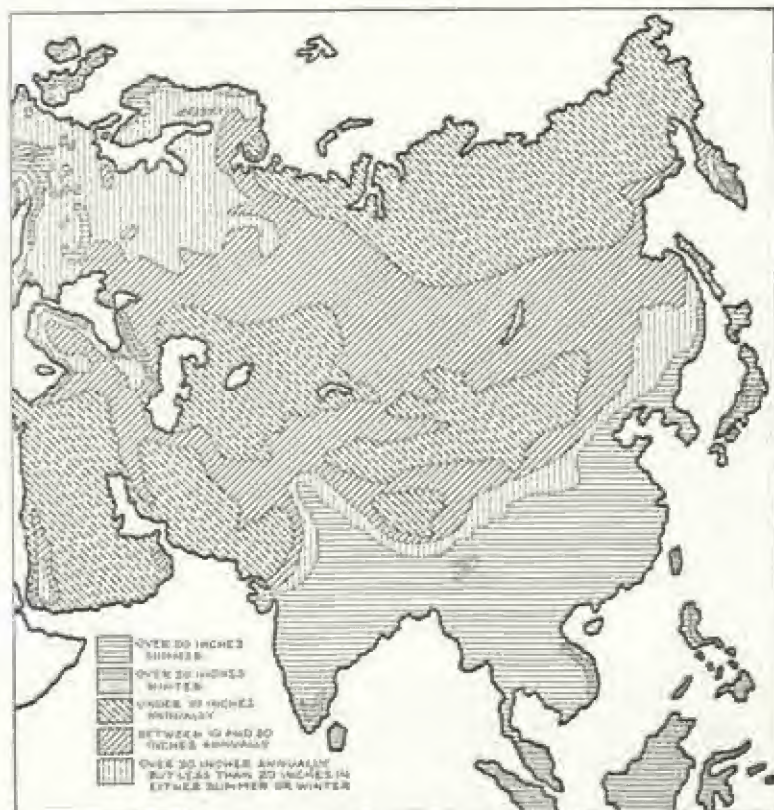
Arctic belt, in many of the high mountains, and across the most-elevated plateaus. About 12 per cent of Asia, a greater area than is cultivated, has no month with an average warmer than 50° F. and is therefore in the Arctic or Alpine Tundra type of climate, with either no, or only stunted, vegetation.

Nearly half of Asia has deficient precipitation. About 5 million square miles, or about 30 per cent has interior drainage. This is a high proportion of arid territory. For continental areas as a whole, about 58 per cent are either agricultural or produce useful forest, 33 per cent are steppe, useful for grazing, and 9 per cent desert that is practically useless, if ice-covered Antarctica and Greenland be left out of consideration. A line from the mouth of the Indus to the mouth of the Amur has very little territory on its northwest that receives as much as 20 inches of precipitation annually and comparatively little on the southeast that doesn't. Most of the tundra and taiga regions of Asia are deficient in precipitation, less than five inches being rather typical of the former and less than ten typical of the latter. Their vegetation reflects low evaporation rates, rather than adequate moisture from the air. Arctic ice dams and slight depth to permanently frozen ground, indeed, render extensive areas altogether too wet. Broad swamps occur where precipitation is well below ten inches.

The precipitation that falls in dry, cold-winter, interior Asia is derived mainly from water that has evaporated from the Atlantic Ocean. In winter, when the cold, Polar Siberian air-mass builds up over the northern interior, the direction of wind is predominantly outward. Individual outbursts, in the form of icy burans chill the plains of European Russia or bring cold weather even to Arabia or the western European Plain. Atlantic air-masses have difficulty penetrating the

barrier of cold Asian air and therefore winter precipitation is negligible over much of the territory east of the Urals. During summers the central part of the continent is warmer and its overlying air-mass lighter, so that Siberia is more readily penetrated by invasions of Atlantic air. It is then that precipitation occurs, particularly along fronts (in "cyclonic" storms; ordinarily mild affairs not to be confused with tornadoes, which are violent) similar to those that bring most of the rain in the United States. Precipitation intensity diminishes with increased distance from the Atlantic. By the time air reaches interior Asia it has relatively little water vapor capable of being condensed to fall as precipitation.

In great contrast with conditions of the interior are those along the southern coast, to the east of the Indus. The Indian Ocean is relatively warm at all times. Evaporation sends enormous quantities of water vapor into the overlying air. During summers, when temperatures rise high along the belt just south of the Himalayas, the barometric gradient is toward the land and the oceanic air-mass sends rather steady winds from the southwest. This wind is the *summer monsoon*. Where



Asia: precipitation

it rises, even slightly, condensation forms heavy layers of cloud and precipitation occurs. The rainiest places are westward and southward slopes of hills and mountains. The wettest place on earth, from the standpoint of actual precipitation, may lie in the Khasi Hills, just northeast of the Ganges-Brahmaputra Delta. During August, 1841, 241 inches of rain fell in five days, none of which received less than 30 inches. The total precipitation for 1861 was over 900 inches, 366 of which fell in July. On June 14, 1876, 40.8 inches fell during twenty-four hours (not a world record, Baguio, north of Manila, has been known to better it). Cherripunji, where these notable rainfalls were measured, averages 452 inches per year in spite of dry winters. Short-record stations nearby may average 40 inches more than Cherripunji. Pacific trade-wind islands have far steadier rainfall. Mt. Waialeale, in the Hawaiian group, averages 460 inches; claimed as a world record.

Monsoon rainfall is concentrated during the summer months. Three winter months are notably dry. The spring is a time of somewhat variable weather, wet after the "bursting," or arrival, of the southwest winds. The rainy period ends in the fall. Not uncommonly the warmest month of the year occurs in late spring, while skies are still clear and the sun's rays beat down on the land. The heavy cloud sheet of the monsoon season lowers temperatures a little. The weather is actually less pleasant and seems hotter, because the humidity is so high and nights bring inappreciable drops in temperature.

The *winter monsoon* of southern Asia blows from the northeast, because Indian Ocean pressures are lower than those along the Himalayan slopes and the Indo-Gangetic Plain. Continental air is dry and little rain results from its ascent. Air which has swept across the Bay of Bengal, however, picks up enough moisture to bring winter precipitation to the southeast-and-southern Deccan and Ceylon.

Monsoon tendencies exist in all continental land masses. The prevailing wind at New Orleans, for example, tends to be northerly in winter and southerly in summer. Along the eastern coast of Asia there is comparatively high proportion of landward drift in summer and seaward in winter, so that eastern China and Japan are ordinarily grouped among "monsoon lands." The west coast of Japan receives a fair amount of winter rain as a result of moisture collected over the Sea of Japan during the winter, when winds blow prevailing from the northwest.

Tropical storms, known in the Caribbean and

Gulf of Mexico as *hurricanes* and in the western Pacific as *typhoons*, are large (up to 200 miles in diameter) wind-whirls with clear centers, *eyes*, surrounded by inflowing air. Wind velocities are intense, up to 200 miles per hour, or more in extreme cases; cloud layers are thick and dense around the eyes; and precipitation is commonly torrential. Practically all of the 10-, 20-, or 30-inch and more precipitations coming in one day are associated with these storms. Hurricanes occur mainly during late summer and early fall, although northern hemisphere examples are known from every month in the year. Their winds are so violent that even the sturdiest battleships are ordered to avoid them and they are responsible for widespread destruction of trees and other damage on land. One of the worst features is the reversal in wind direction on either side of the eye.

Most of these disturbances originate on the western sides of the major oceans some distance north of the equator and move rather uniformly northwestward to about the latitude of 30° N., where they *recurve* toward a northeastward course. Many strike the Philippines and Japan. Some reach the coast of China. A few travel across the entire Pacific, toward Alaska or British Columbia. Their energy is derived from heat liberated when water vapor condenses. Once a supply of abundant moisture is unavailable, they cease to operate. A fair amount of precipitation, extremely irregularly distributed as to month or year, is brought by typhoons to southeastern Asia and the coast as far north as Japan.

Asia extends through all of the major climatic temperature zones. Most of the Deccan, lowland Burma, Indo-China, and islands to the south have no month as cool as 65° F. and hence are in the Tropical temperature zone. Next comes the Mesothermal temperature zone, where the coolest month averages between 65° and 32°. Its northern limit encircles the peninsula of Asia Minor, extends along the southern side of the plateaus north and east of Mesopotamia, along the lower slopes of the Himalayas and ranges to the east, crossing China south of the Tsinling Shan to the southern side of Shantung Peninsula, cutting Korea (Chosen) about in half and passing through Tokyo.

To the north of this Mesothermal, or warm-temperate, belt is the Microthermal, cold-temperate region, limited on the north by the absence of an effective growing season, or the isotherm of 50° F. for the warmest month of the year. To the north is the Tundra climate, along a rather broad strip of Arctic lowland and plateau. Tundra and other cooler-climate belts are also reached by vertical ascent in lower latitudes, as in Tibet.

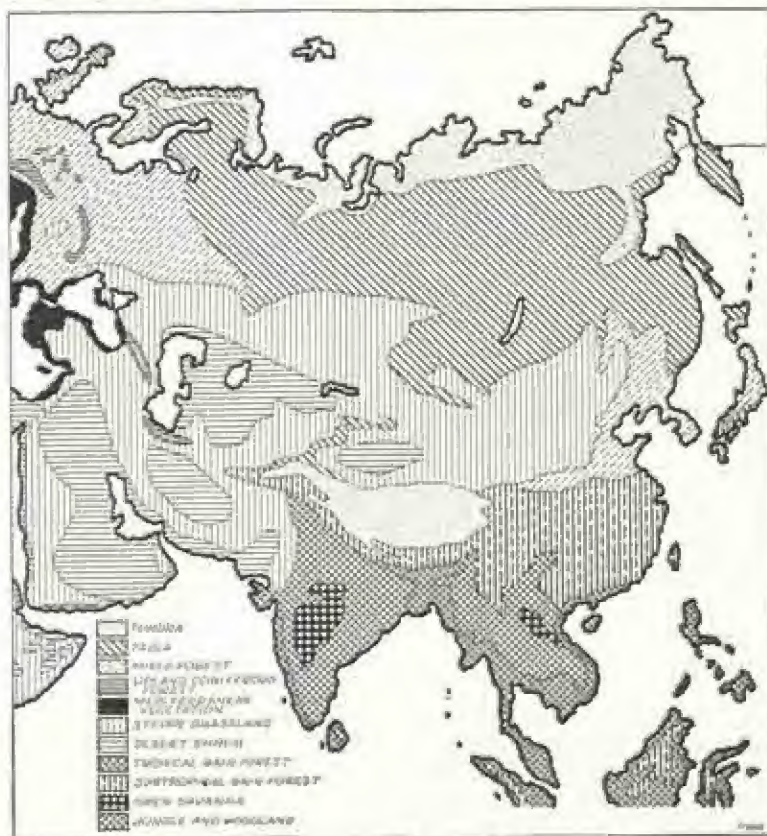
Vegetation follows climatic distribution rather closely. Barren deserts stretch from Arabia to parts of Mongolia. Associated with them are local and marginal saline steppe floras, luxuriant oasis vegetation, and similar Dry World vegetational characteristics. More extensive than actual deserts are the steppes, where short- or medium-height grass grows in localized "bunches" in more arid places, or as a *closed formation*, spread more uniformly, as in a lawn, where more moisture is available.

To the north of the dry climates are such European World plant assemblages as the Mediterranean vegetation of the margins of Anatolia; the mixed forest of western Siberia; the taiga north of the mixed forest and of the steppe; and the tundra of the Polar World. Within the dry climates are uplands extending through similar zones of vegetation, even to barren summits above alpine tundra. South and east of the dry climates are the plant associations of the Oriental World.

The most luxuriant forest occurs in the equatorial islands and wetter parts of southeastern Asia. This is the tropical rain forest, similar to that along the Guinea coast of Africa or to much of the Amazon Basin of South America. Tree growth is so dense that most of the ground is shielded from sunlight, a fact unfavorable to the growth of grass and the presence of large land mammals. Trees are mainly broad leaved and evergreen. Growth conditions naturally resemble those produced artificially in hothouses. Enormous as is the volume of wood in these tropical forests, they offer little to tempt exploitation. Many of the trees yield lumber of no value. The variety is so great and individual woods differ so much in hardness that mills have trouble getting logs that can be run at comparatively uniform saw speeds. There are individual trees producing extremely valuable tropical lumber, such as ebony

and many varieties of mahogany. For most building and other purposes, however, the conifers of higher latitudes constitute the important commercial forests of the world. On the Asian mainland, tropical rain forest occurs along the west and the southeast coasts of the Deccan, in Bengal, in western Burma and in scattering highlands of Malaysia.

The monsoon forest, which covers much of the Deccan and lands along southern Himalayan slopes and eastward to the south coast of China, occurs where there is a distinct dry season in winter. Trees drop their leaves as a response to dryness, rather than winter cold. In summer growth resembles the rain forest but winter finds open landscapes. This is *jungle*, rather than rain forest. Big game finds its way into monsoon forests and they are readily cleared for agricultural use. Teak is one of the most useful trees, having a wood provided naturally with oils that prevent rusting of iron, a property rendering it valuable for use in shipbuilding and finishing. Screws and bolts remain useful and hold firmly, even under the rust-accelerating influence of salty air. Deodar is another fine and useful wood, with



Vegetation of Asia

decay-resistant properties similar to those of redwood and cypress. The variety of trees is great in monsoon forests, many have beautiful blossoms, and some produce edible fruits or nuts.

The native forests east of the dry climates, from China north to beyond the Amur, resemble the mixed forest of the European Plain, or of the eastern United States. Broad-leaved, deciduous trees, that drop leaves during the cold season, cover lowlands and areas of better soil. Conifers grow on slopes and places where the soil is well drained. Northward, this forest grades into typical taiga. It is readily cleared and contains many useful woods. This valuable forest is now greatly reduced in area.

The monsoon lowlands naturally grow tall savanna grasses, such as bamboo, and a wide variety of trees along stream courses, on hills, and other places where they are not crowded out by grass. These characteristics are particularly true of India and southeastern Asia. In the higher-latitude savannas that extend northward through China and lowland Manchuria, the grass is shorter and progressively approaches growth characteristics found in better steppe-climate areas. Readily cleared and put into use, monsoon lowlands produce such crops as jute, indigo, and, most important of all, rice.

POPULATION

Most of Asia is sparsely populated. Many areas are too poor for pastoral nomadism. Well over half of the entire continent supports only nomads, or a few population knots in oases. The Polar World area is vast, but contains extremely few people. The steppe and desert populations are comparatively minor, as is also the case in the extensive taiga. Yet half the population of the world lives in Asia, on about one quarter of its area, in countries along the two maritime coasts. The population of the world is on the order of 2.3 billion. In non-Soviet Asia there are about 1.3 billion.

Dense populations are always supported by agriculture. In many ways man is better suited to a meat than to a cereal diet. People in polar regions and deserts live almost entirely on animal products. In more densely populated lands, however, these diets are too expensive. Meat and milk tend to become luxury items that few can afford. Man ordinarily adjusts himself to almost any condition that confronts him. He calls bread "the staff of life" and regards the eating of oatmeal as virtuous, if he faces an economic pattern that

requires him to eat such foods. When man and animal have to compete for land, man wins. Where populations are extremely dense, as in Japan, animals become a luxury, taking land that could produce more calories of energy if planted to cereal crops. In moderately populated lands, animals are likely to be given greater proportions of the territory. Thus the Argentinian is accustomed to a diet of beefsteaks that seems incomprehensibly large to the European, or even to the citizen of the United States. In southeastern Asia, little meat is eaten. No particular hardship is felt. Convenient cults of vegetarianism or even religious taboos usually arise in such cases. A taboo against pork among people whose religion is of desert origin is directly in accord with hygienic conditions in a climate where pork spoils rapidly. A preference for mutton among most dry climate populations agrees with the desirability of having an animal with a small carcass, which can be eaten completely rather soon after killing. Practically all peoples in India have religious taboos against meat, which few could ever afford anyway. Fish never compete with man for living room. Dietary and religious cults commonly regard them highly.

There are five main types of advanced Asiatic agriculturists: (1) the lowland Oriental World rice grower, a vegetable gardener, who is extremely skillful in producing great quantities of food on small plots of ground. He is among the best of the world's farmers, conserving and enriching his soil with human manure and other fertilizers when available; (2) the oasis farmer of the dry climates resembles the Oriental gardener in many ways, practicing intensive agriculture, and being highly skilled in the art of irrigation; (3) the marginal farmer of the steppe who follows *dry farming*, depending on letting land lie fallow, plowing and planting at precisely the right time to conserve limited amounts of moisture. His field agriculture resembles that of the European World and his type of farming is rather common among European peoples; (4) the Mediterranean agriculturist of Asia Minor and the Levant is primarily a horticulturist. He uses irrigation, garden agriculture, and field agriculture; (5) the typical European field agriculturist appears in the Siberian Wedge of the European World. He sows broadly and farms rather carelessly in terms of Oriental garden agriculture, depending on adequate precipitation and temperature conditions to mature his crops. Of course there is much overlapping of these types of agriculture. Some of the world's best gardeners are in Europe, and irrigation commonly accompanies field agriculture. In general, however, the average

agriculturist in lands along the two maritime coasts of Asia fit into the first pattern listed, those of the Dry World part of Asia into the second and third, peoples along the Mediterranean and southern coast of the Black Sea into the fourth, and the Russians of the Siberian Wedge into the fifth.

Asia also has many forms of primitive agriculture. Upland rice may be planted with the digging stick. Many minor tribes follow a migratory fire and hoe agriculture in which fields are never cleared of stumps and fields are abandoned as soon as decreased yield is noted.

CONTRASTS

Asia is a continent of contrasts. It contains the highest and the lowest land on earth, 29,141 feet above and -1,292 feet below sea level. It also contains the coldest part of the world in January and possibly the hottest in July. The coldest point has the world's record mean annual

temperature range. Asia has the rainiest large area on earth and some of the most extensive and driest deserts. Its vegetation includes tropical rain forest, extreme desert, tundra and lands too cold in summer to have any vegetation whatever. Though three quarters of the continent is totally or almost uninhabited, half of the world's population lives on 10 per cent of the world's land area along its southern and eastern coasts. Only 8 per cent as many people live in all the rest of Asia as along these maritime belts. Indian and Chinese population density is great enough to raise the average for the entire continent to above 70 per square mile, whereas the average inhabited land of the entire world has little more than half that figure.

From the cultural standpoint, the contrasts in Asia are so striking that it is necessary to divide the continent into four separate culture worlds: Polar, European, Dry, and Oriental.

41: Introduction to Indian Realm

The Oriental World extends around southeastern Asia, from Dry World Baluchistan to the Far Eastern Area of the Soviet Union. It includes the maritime southern and eastern coasts of the continent, where monsoon influences either dominate climates or are rather strongly felt. Dry World conditions bound almost the entire inner part of the Oriental World. The Indian and Pacific oceans face it. Its cultures extend out across marginal seas to the arcuate islands from Cape Negrais, Burma, to Japanese-colonized islands beyond Hokkaido.

The cultural distinction between Europeans and Orientals is extremely sharp. To Europeans, Oriental World peoples at times seem highly irrational. Codes of conduct, sense of values, and ways of life are decidedly foreign. The European, noting what he considers archaic culture traits and appraising natural resources, sees many ways that the Oriental World could be "helped," but his "helping" means conversion to European ways of doing things. Some Japanese and a few other people in the Oriental World have thought such "assistance" desirable, but most of the Oriental World is strictly opposed to innovations, particularly of European origin. The Oriental is likely to feel himself spiritually superior, a member of civilizations extending back into extreme antiquity, one who tolerates the ways of others but does not admire them, and altogether superior to the crude, commercial, upstart European, whose civilization has climaxed in an extremely brief interval and may destroy itself as promptly.

The Oriental World is an amorphous agglomeration of peoples, a region unified by confusion of tongues, complexity of social organizations, diversity in religions, and general absence of European types of political organization. For a rather brief span of years Japan has departed from the general pattern in building a nationalistic state, but no other Oriental World people has ever achieved political unity at all equivalent to that of such European states as France, Spain, or even Poland. Among the natives there is no such word as "India," nor was there ever such a concept until the British to some extent unified the many

peoples there. China, along with other places, has now and then been under the rule of important dynasties, but never has it become a nation of peoples who have had general awareness of being Chinese, nor the bond of a national language that could be generally understood.

Individual culture traits of the Oriental World often seem incomprehensible to the European. Man's willingness to subordinate his individuality and possession of life itself to a degree where mass suicides follow trifling insults to the honor of someone whom he accepts as a living god or even as a minor master, his acceptance of rigid caste systems in which the mere casting of his shadow on the form of a superior is sufficient to decree his death, or the placing of women after marriage in huts where they are never to see a man other than their husbands, and rarely another woman, are things readily accepted by vast hordes of Orientals as being normal, but that seem abhorrent to most Europeans. Marriage of girls at ages of ten or less, or the arrangement of marriages by elders, without consent of the individuals concerned, systems that have worked extremely well and which possibly would be favored by the impartial judgment of scientific investigation, are repugnant to the European mind.

Oriental landscapes contrast sharply with those of other culture worlds. Exotic trees and animals meet the eye of the European. Avenues of communication, except where developed under European influences, are waterways and trails upon which peculiar boats or strange ways of carrying goods appear. Architectural forms are bizarre; images of gods grotesque. In India man is served by awkward buffalo, inefficient humped zebu (oxen), or camels. In China he does the chores of draft animals himself. Man's implements are crude; his normal habitations are hovels. The Oriental, of course, would disagree with most of these ideas. To him his culture world is normal.

After the Voyages of Discovery, the Oriental World presented the richest of prizes to European conquerors or exploiters. The New World Revolution tactics of the European, however, generally bogged down under well established Oriental cul-

tures. Unlike the primitive peoples in the Americas or the Pacific World, the inhabitants of the Oriental World did not accept European ways, nor could they be exterminated. The Europeans, since the sixteenth century, has worked vigorously, installed railroads, built cities, encouraged trade, sent missionaries of many varieties, established empires, policed conduct, and exploited natural resources. If he made it possible for life to become more stable in certain areas, or provided livelihood for more people, by constructing irrigation works, draining swamps, or introducing new crops, native peoples simply multiplied with more than ordinary rapidity, so that greater numbers were present to resist Europeanization. The hold of the British, French, Portuguese, and United States has relaxed appreciably since World War I, and is generally threatened throughout the Oriental World today.

To state that about half of the world's population is concentrated in the Oriental World or to give populations in millions is to present rather difficult concepts. Possibly some appreciation of the meaning of such numbers can be gained from the statement that if the people of India were whisked by a certain point at a rate of one per second, 3,600 per hour, 86,400 per day, it would take twelve and one-third years to complete the task. To put it another way: suppose they were grouped into cities of 86,400 each; there would be about 4,500 urban units of that size; or they could be formed into 450 cities of 864,000, which is about the population of Baltimore. Baltimore covers an area of 85.6 square miles. If the population of India were gathered together into exactly the same order of congestion as exists in Baltimore, into one huge conurbation, it would be 100 miles wide and over 385 miles long, or have an area larger than Indiana. China has an even greater population than India, roughly in the ratio of 15:12.3. It would take over fifteen years of continuous observation to see all its inhabitants at a rate of one per second! In the fifteen years, however, there is a net increase of over 75 million people in India. The population of China would double in 65 years if rates of births and deaths of recent years continue.

The Oriental World has three main realms, Indian, Chinese, and Malayan, with transitional territories between.

INDIAN REALM

The Indian Realm of the Oriental World is closer to Europe in many ways than are the other

realms. Its people are Mongoloid to only an extremely small degree. Though once inhabited by Australoid and Negroid peoples, remnants of which remain, the majority of peoples are basically Mediterranean in racial stock at present, and their languages are mainly Indic, a branch of the Indo-European stem, rather closely related to Iranic tongues. Europeans have been in contact with India for well over 20 centuries.

When Alexander the Great conquered northwestern India, in 326 a.c., he found a land with a civilization that was already old. Highly inflected languages were in use. The written Sanskrit had already developed an extensive literature. Gautama, or Buddah, had died in about 480 a.c. His followers had developed one of the first great religions associating moral codes with theology. People were trying to lead upright, sinless lives, and seeking salvation after death; concepts that we would regard as advanced and refined in contrast to the crude and immature religions of the Greeks. Architecture had advanced far beyond anything known in the Mediterranean region. The largest stone buildings on earth were in India, inhabited by monks. Ornate designs requiring expert craftsmanship were already in evidence. Our European taste generally is one that prefers the simplicity of Greek architecture, but an Indian of the time of Alexander would have regarded Greek structures and styles as primitive. Europe was poor and barbarous territory in comparison with India, where people could make excellent cotton fabrics, superior copper and brass wares, and excellent steel. The European possessed little industrial skill and for many centuries imported such manufactures from India. India was also a source of precious gems, which Europeans couldn't have cut and polished even if furnished with the raw materials; spices of various kinds, especially pepper; and luxurious oils.

India was no more a united nation in Alexander's time than at any time since. It was a region of diverse peoples, large numbers of people, with many tongues, inhabiting various kinds of territory. No links existed that unified Indians in culture, tradition, history, or religion.

The word, India, is of foreign origin. *Sindhu*, meaning flood, was first applied to the Indus River. Greeks called the people *Hind*, and their country, *Hind*, or India. The Persian name, *Hindustan*, has come to refer particularly to the Ganges Plain.

The political immaturity of India at the time of Alexander was not an expression of newness in the arrival of its inhabitants. It was preference that has continued down until recent years. India was old culturally when Alexander arrived. It had sent wares to Egyptians and others at dates as far

prior to Alexander's time as his is to ours. Hanno had left Egypt in 2750 B.C. to find the mysterious land of Punt, or Pun, which was the immediate source of many luxuries, such as ivory, perfume, cinnamon, and sandalwood, as well as the finest textiles known to the Egyptians. The Himyarites of Yemen, and probably the ancestors of the Phoenicians, had ways of getting Indian wares for the peoples of the western world at extremely early dates.

After the decline of the Roman Empire, the Arabs, especially those of Oman, were the transporters of Indian wares to Europe. In Europe itself, the Italian City States became the great importers. Their rivalries and hostilities led to serious decline in Indian trade, which practically ceased when the Ottoman Turk extended his power across the several routes between East and West. Europe was not content to let the trade die. The Crusades had brought too many Europeans to the Levant, where they witnessed products superior to those at home and acquired tastes for luxuries such as Europe could not provide. Dependence on India forced Europeans to seek new routes and to embark on the Voyages of Discovery. So important was India that Columbus, in sailing westward, willingly deluded himself into the idea of its discovery and made the mistake of calling the American aborigines, Indians, a term that has been so confusing that there is a strong tendency to correct it even at this late date, by introductions of such words as Amerinds.

The Portuguese were first in Indian trade during the Commercial Revolution, having reached Ceylon as early as 1505. Remaining from the ruins of an empire which had Papal authority to embrace the lands of half the earth is Goa, a small possession on the west coast; Damão, a speck of land near Bombay; and Diu, a small island on the Kathiawar Peninsula, west of the Gulf of Cambay, as

Portuguese India today. Together these possessions have an area of 1,537 square miles and population of 667,000. Mormugao, in Goa, is a source of manganese. Coconuts, fish, cashew nuts, and various spices are among the exports.

The Dutch replaced the Portuguese as masters of Indian trade. Galle, in southwestern Ceylon, was once important as a Dutch base, but, like the Portuguese, the Netherlands soon lost out in Indian trade. Their energies were concentrated on the East Indies, particularly on Java, where they built an important colonial empire.

The French formed an East India Company in 1647 and for some years were rivals of the British. Pondicherry, on the Coromandel Coast, about 150 miles north of Ceylon, was established as a base in 1683. After changing hands eight times it finally became French again in 1816. French India is divided into five parts: Mahe, on the Malabar Coast, north of Calicut; Karikal, not far north of Palk Strait, north of Ceylon; Pondicherry; Yanaon, on the delta of the Godavari, east of Hyderabad and near Cocanada; and Chandernagor, now a part of India, just inland from Calcutta. Together these possessions have an area of but 196 square miles and a population of



India: political divisions

346,000. Pondicherry has some cotton mills; some oil seeds are exported; but French India is of even less commercial consequence than Portuguese India.

The London East India Company was formed in 1600. Its first objectives were in the Moluccas, China, and Japan. By the middle of the century it had established trade in Bengal. From Dacca it sought muslin. From the Coromandel Coast it exported dyes and spices. Bombay was ceded to the British East India Company in 1661, but the present location of the city was not established until 1708. The British were active in wresting commercial supremacy from the French and other rivals. Between 1600 and 1813 India was regarded chiefly as a source of goods and materials desired by Europeans. Posts, or factories (depots), were established along coasts. Sources of supply were encouraged by such practices as taking advantage of the political chaos that existed among the natives, backing one ruler against another, bribing influential people, and sending troops to police territory where trade faced hazards or hostilities. Without planning an empire, commercial control became military and, eventually, political governing. Between 1813 and 1857 serious attempts were made to develop India as a market for British goods. The British holdings were so extended that possession was passed from the Company to the Crown. In 1877 India was declared an empire, with Queen Victoria as its Empress. After politically becoming an official member of the British group of countries, colonies, and possessions, India became a field for British investments. Since World War I one of Britain's major problems has been to protect those investments.

It can hardly be argued that the British have been benefactors of India. While railroads, dams, cities, and other improvements have been numerous, the British "helping" of India has been directed chiefly along lines that stimulate production and trade. Though British control began in 1813, India's great majority of people are still in desperate need of improved health conditions, livable incomes, education, and services of all sorts. The per capita income is still only about 7 per cent that of the average Englishman. Life expectancy is probably less than 25 years. Some 86 per cent of all males and 98 per cent of all females are illiterate.

British India and the many native states of pre-World War II India have become two British Dominions, India and Pakistan. The latter is Mohammedan and the former is not. Pakistan consists of two widely separated parts, in the far

east and the west. The northern state of Kashmir will join one of the Dominions. Its Mohammedan population probably prefers Pakistan but its ruler prefers India.

The Indian Realm is not coincident politically with India and Pakistan. Its nucleus is the lowland south of the Himalayas. Its typical parts extend southward across the peninsula to Ceylon. To the west it encounters a transition to Dry World territory of Baluchistan and Afghanistan. There is similar transitional territory in the north, through Kashmir, Nepal, and Bhutan to Dry World Tibet. Burma is transitional territory eastward, into the Malayan Realm of the Oriental World.

On many relief maps using colors to represent elevations, such as green for lowlands, yellows and browns for intermediate heights, and red for high mountains, India has the appearance of being a triangular area beneath a huge, gathered red drape. A graceful fold extending along the arcuate Himalayan ranges is gathered toward Pamir and north of Burma, with hangings extending down either side, along the Sulaiman and Kirthar ranges to the west and along the many deeply furrowed mountain chains of Burma and southeastern Asia on the east. India is thus set apart, suggesting a cultural unity that hardly exists. Geographically it is a "sub-continent," well isolated from other useful lowlands. Actually it is a culture realm with extraordinary diversification and one long in touch with distant peoples.

India is divisible into three main parts: (1) mountain borders; (2) river plains, of the Brahmaputra, Ganges, and Indus; and (3) peninsular India, including the Deccan Plateau and hilly country northward to the river plains.

DRY WORLD TRANSITION

The mountain borders to the west and north of India are culturally transitional into the Dry World.

The Makran Coast of southern Baluchistan, west of Karachi, is a difficult passageway to Iran and Oman. From the climatic standpoint it is extremely arid. Dates are produced in some quantity at various oases. Fishing is important to the meager population, providing food for both man and livestock, as in southern Arabia.

To the north are many camel trails and a few good passes connecting the Indus Valley with Iran, the most important pass being Bolan, with its railroad and highway connections westward. The British administered territory along the railroad, Kalat is the political center of the natives and Quetta was a fortified British outpost. The

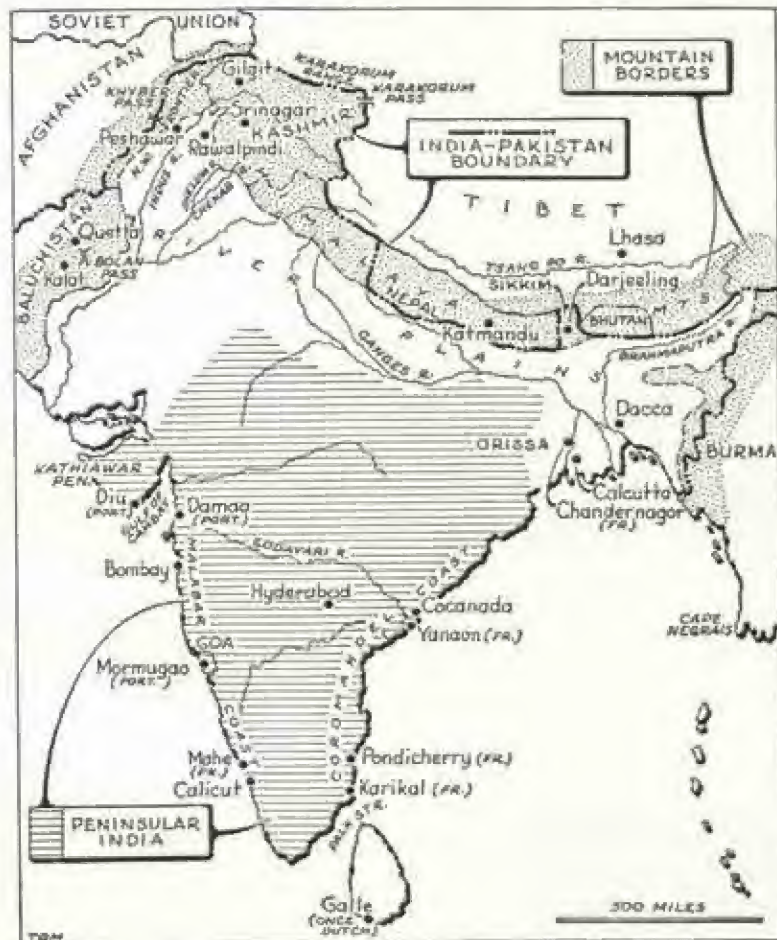
Bolan River has insufficient volume to reach the Indus. Though the British parts of Baluchistan are now part of Pakistan, most of the country is culturally Dry World, with transitions into Indian Realm cultures eastward toward the Indus.

The boundaries of Afghanistan limit the nation to Dry World territory. Between that buffer state and India is a second line of defense, the North West Frontier Province, which extends as a strip from the northern boundary of Baluchistan to the eastern strip of Afghanistan along the Hindu Kush, keeping generally west of the Indus. Though the province is small, 14,263 square miles, the 3 million inhabitants are tribal and very much like the Afghans in tendencies toward pillaging and raiding, proclivities that serve India well from a general standpoint in that they help insure isolation from peoples to the northwest, but which at times backfire when the frontier peoples turn attention toward the Indus. Peshawar, 131,000, the capital, is the guardian of the railroad leading toward Khyber Pass and of the upper Indus Valley. It long maintained the influence of the British among the people of the province.

Kashmir, a territory about the size of Kansas, over 82,000 square miles, with a population in excess of 4 million, includes not only a large Native State of uncertain political destiny, but also many feudal holdings, with governmental organizations somewhat like those of Medieval Germany. The upper Indus flows northwestward from Tibet through its heart, between the Karakorum and Himalaya ranges. In places the river has cut a gorge up to 17,000 feet deep. In the vicinity of Gilgit it makes several complicated bends, eventually swinging to the south-southwest into its lower valley. Northern Kashmir is cold and very largely uninhabited Tibetan-type territory.

Across it are several extremely difficult routes from the Pamirs and other Soviet territory to India. To the east of the deepest Indus gorges is Karakorum Pass, over 18,000 feet high, a route leading from Soche (Yarkand), in Sinkiang. Leh is the main eastern outpost in Kashmir, on not only the Karakorum Pass trail but also the main route southeastward toward the upper Brahmaputra (Tsang Po) and Lhasa. The remote parts of Kashmir are Dry World territory similar to Tibet, with nomadic populations depending on sheep, goats, and yaks for livelihood. Here exists some of the world's finest alpine scenery, with many active glaciers, moraines of Ice Age ice streams, and glacially scoured valleys extending down to an elevation of as low as 6,000 feet. The snow line, above which summers restrict the previous winter's snow blanket, lies at about 19,000 feet.

The more useful parts of Kashmir lie to the southwest. The Jhelum and Chenab rivers of



India: physical divisions

Punjab cut across the outer ranges of Kashmir, connecting important interior valleys with the upper slopes of the Indus plains. Srinagar, 208,000, the capital, lies on the margin of an old, now partially filled lake on the Jhelum. It is not only a center for such industries as making shawls, rugs, other woolen goods, and wood carvings, but also one of the world's finest resorts. At an elevation of approximately a mile, it has delightful summer climate. Elaborate house boats, with retinues of skilled servants, have been available to visitors at prices that seem ridiculously cheap to Europeans. The Mohammedan native population is virile and comparatively progressive. Silk, tea, deciduous fruits, vegetables, barley and other crops are raised in surplus. Rawalpindi, 181,000, stands guardian of the gates to Kashmir.

Along the Himalayan front, between Kashmir and the eastern lowlands of the Brahmaputra, are, in turn, hill states of Punjab; mountain states of the United Provinces; the kingdom of Nepal; the British Protectorate, Sikkim; the kingdom of Bhutan; and mountainous parts of Assam. Vegetation is tropical up to an elevation of about 6,500 feet. Rainfall and luxuriance of plant life increase eastward to astounding proportions in Assam. In the monsoon forest are such trees as oaks, magnolias, palms, and sal, an important source of timber, and a variety of tall grasses, including bamboo which is useful for constructional purposes. From about 6,500 to 11,000 feet is a "temperate zone," similar to "tierra templada" of the American tropics, where such trees as maples and conifers begin to appear in the forests. Rhododendrons and alpine plants characterize higher elevations, between the tree line and the snow line, or from 11,000-11,500 to 18,000-19,000 feet. Various relatively pure and greatly mixed tribes of Caucasoid and Mongoloid peoples, quite largely Buddhist in religion and culturally rather close to Tibetans, inhabit the Himalayan belt.

Nepal, 54,000 square miles and 7.0 million population, is an elongate kingdom along the southern watershed of the highest part of the Himalaya. Caucasoid and Mongoloid aborigines were invaded by Caucasoid Gurkhas from the Indus plains. The Gurkhas have admixed with the original inhabitants to form a Nepalese people who dominate the country at present and from whom the British have recruited many fine soldiers. Once a stronghold of Buddhism, Nepal is gradually being converted to Hinduism. Foreigners are rather rigorously excluded from travel through Nepal, as through Tibet, but relationships with

the British are comparatively cordial. Though much of the country is bleak upland or steep, densely wooded slopes, there are fertile valleys at lower elevations and agricultural country toward the Ganges plains. Katmandu, the capital, lies in an attractive valley, an area of 15 by 20 miles, with 450,000 inhabitants skilled in agriculture. Some of the artistic culture of the Nepalese is displayed locally in some 3,000 Buddhist shrines. Rice is produced in surplus at lower levels, wheat, barley, and buckwheat at higher. Grain, hides, cattle, chillies, tumeric, ginger, tea, and quinine are exported.

Sikkim, 2,745 square miles and 136,000 population, is a British protectorate, important primarily because it includes the main route from India to Tibet, between Darjeeling and Lhasa.

Bhutan, 18,000 square miles and 300,000 population, has a British-subsidized ruler and is a primitive, Mongoloid, Buddhist country of rugged terrain, densely forested at lower levels. From it comes a trickle of such products as lac, wax, musk, elephants, and ponies. Rice, various millets, and maize are principal foods. Similar territory extends eastward to the great bend of the Brahmaputra.

The Dry World transition, in general, is recognized politically by the presence of elongate states, some of which are more or less independent; all of which are either directly or indirectly under rather close ties with the British. The transitional zone is broadest toward the west, where desert and steppe climates extend well into India. Here the dry-climate zone has been invaded by peoples with Indian cultures. To the north the transition is into Dry World of a peculiar variety, where nomadism is a result of extreme elevation as much as, or more than, aridity. The dense forests along the southern slopes of the Himalayas are about as effective as the taiga as a cultural barrier. The lowland parts of such states as Nepal are culturally part of the Indian Realm, whereas the uplands are culturally close to Dry World Tibet.

CULTURE BACKGROUND

India lies in the belt between Africa and western Pacific islands which was once inhabited by Negroid peoples. Negroid Asiatic Pygmies still live as tribal groups in the Andaman Islands, central Malaya, and in east Sumatra. In mixed form the stock is a recognizable substratum in southern India.

Australoids, or Archaic Caucasoids, peoples who may have covered most of Eurasia at some remote time, followed the original Negroid peoples into India. They overran all of India, to become

its dominant pre-Dravidian population. Remnants in rather pure form are found as tribes in the most inhospitable regions of the Deccan, extending northeastward into the poor parts of Orissa Province, well toward Calcutta. The Veddahs of Ceylon represent this stock. They average five feet in height; have the smallest of human heads, which are long and narrow; with low, broad faces; triangular noses, depressed above and flaring to enclose two round prominent nostrils; skins chocolate brown in color; fine, wavy or coiled head hair, black or slightly reddish; and small amounts of facial or body hair, even eyebrows and eyelashes being feebly developed. The Australoids on the mainland of India are slightly taller, with somewhat larger heads and similar faces, and blacker skins. Body hair is almost wanting but curly black or dark brown hair appears on the head and may grow into moderate beards. Such Deccan tribes as the Kadir, Kurumba, Paniyan, and Irula, and the Bhil, Gond, Kandh, Oraon, and Kolarian to the north are mainly Australoid and pre-Dravidian in racial stock.

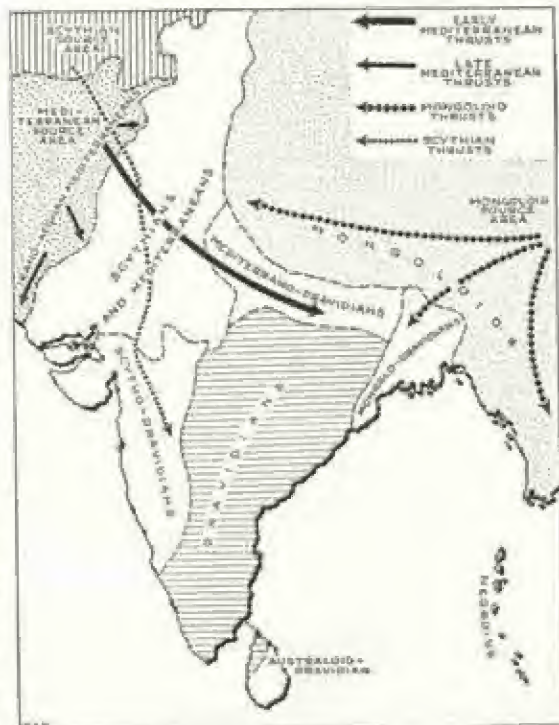
Peoples from both the northwest and northeast migrated into India for thousands of years, mixing with pre-Dravidian stocks and ultimately blending into the Dravidian type. The Dravidian is short, dark-skinned, and presents many Australoid features. Both Dravidian and East Indian stocks, other than aboriginal Negroids, exhibit many racial traits characteristic of eastern Asia. Much larger proportions of Mongoloid blood exist in Burma and among the peoples of the Himalayan borders, however, than in most of India itself.

Later migrations into India came mainly from the northwest and resulted in the establishment of peoples who are predominantly Caucasoid across the Indus and Ganges plains and in better parts of the Deccan. These Caucasoids are Mediterranean, closely related to the peoples of Iran, Afghanistan, parts of Arabia, and parts of Turan. Many have curly or wavy hair. Skins vary from black through various shades of dark brown to light brown. Statures are relatively short for Caucasoids; heads vary from long to medium, with noses of moderate width. Bodies are comparatively slender and well proportioned. During later migrations many peoples with broader heads appeared. These are commonly regarded as Scythians and their mixture with earlier stocks are sometimes called Scytho-Dravidians. Relatively broad-headed peoples are especially numerous in northwestern India, in the Punjab, and southward along the western part of the Deccan, especially in regions of better soils. The Marathi-speakers in the vicinity of Bombay are such people and they were long powerful politically. The very latest main groups

to invade India from the northwest are distinctly Irano-Afghan Mediterraneans, with tall statures, high heads, and prominent hooked noses.

The general effect of migrations of people into India at various dates during the last 50 centuries or so has been that of driving the pre-Dravidian populations to Ceylon and the worst parts of the Deccan, the Dravidians to relatively poor Deccan territories, and the establishment of more purely Caucasoid peoples over the better parts of the river plains of the north and the best soils of the Deccan. Mongoloid-Dravidian mixtures are most numerous to the east, in the mountains and wet valleys toward Burma and along the Brahmaputra. Social distinctions arose in which the more purely Caucasoid peoples were likely to land at the top of the scale and the less Caucasoid at the bottom.

Ancestral Indo-European languages assumed written form by at least 500 B.C. Sanskrit is kept alive artificially today by scholars, much the way that Ancient Greek and Latin have been perpetuated. The Indic tongues became extremely diversified. In India today there are some 200 languages, 10 per cent of which are native tongues of at least a million people. Language barriers have prevented cultural unity. Punjabi, Hindostani, Bengali, and several other tongues are widespread.



India: races and culture thrusts

Hindustani, which is written either in Arabic or Devanagari, the alphabet employed in writing Sanskrit, is the most widely understood and comes closest to a *lingua franca* for India at present. English is understood by fewer than 3 million.

Never has there been as unified political control as under the British, but their system was extremely complex. British India consisted of 11 main provinces with considerable autonomy, plus the 574-square-mile area of Delhi, which resembled the District of Columbia in having its own administration. These provinces cover about two thirds of India. The remainder was divided among "agencies" and native states, of which there were twenty-seven main units and, in all, some 700 individual feudal governments. British India covered over 865,000 square miles, slightly over three times as large as Texas, with a population of 296 million, which is about twice that of the United States. The native states covered 296,000 square miles, still somewhat larger than Texas, and had a combined population of 93 million, which is about 60 per cent of the population of the United States. Some show of independence was made by native states. Their local Rajas, or rulers, had British advisors, were more or less subsidized by the British, and fully realized that without British backing their easy living would soon terminate. The rulers of native states included some of the most pro-

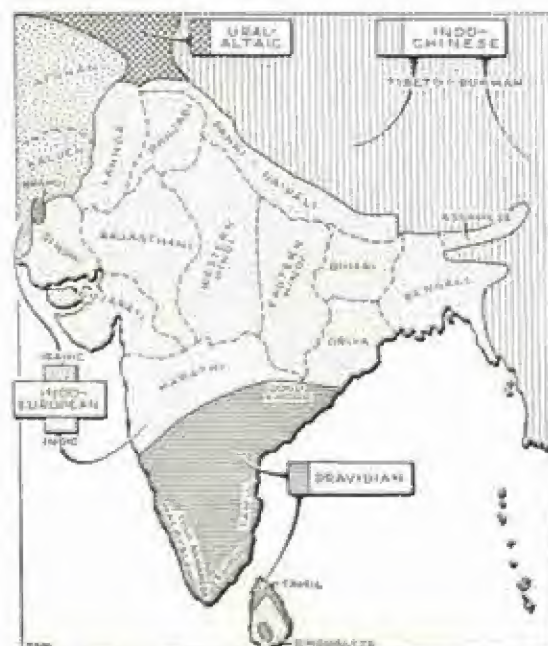
British people in India. Creation of the Dominions promptly ended the era of this relict feudalism.

Traditionally India has been divided into tribal and feudal territories. Conquest had always come from the northwest until Europeans began arriving by sea. Punjab has been the corridor and the Ganges plains the goal of political and military invaders. Few of the conquests had much effect on the course of Indian history or cultures until a Mohammedan empire spread eastward along the river plains in the twelfth century. Following came a Mongolian conquest. The Great Moguls were Mongol rulers, who generally controlled the river plains at first, and much of the eastern Deccan later. As Mogul control waxed in the north, much of southern India came under the rule of Mohammedans. The boundaries between these main contestants for power and wealth shifted in various directions, and numerous political units appeared. The Portuguese and French did little more than establish coastal bases. The English gradually gained power and political control over practically all of India, but in ways about as complex and variable as had existed before their arrival.

The complexities of racial, linguistic, and political backgrounds in India are hardly more perplexing than the socio-religious conditions that have arisen.

Hinduism, the religion of 272 million Indians, roughly two thirds of the population, is highly philosophical, involving belief in a god with many forms and a whole social system in which each individual is to perform specific functions. Its social system divides the population into castes, or hereditary classes. Brahma created the world; is the essence of the universe, intelligence, bliss; illimitable, and timeless. As Brahm, in a reformed sect of Hinduism, he is the trinity, Brahma, Vishnu, and Siva. The highest caste Hindus are Brahmans, considered a divinely authorized priesthood. As many as 2,400 other castes exist, each with its own particular rights, taboos, and beliefs. At the base of the social scale are some 50 million untouchables, contact with whom would defile members of higher castes, particularly the Brahmans. The sects are innumerable. While in general the more Mediterranean of the Indians are Hindus, there is no linguistic or common cultural background among the many kinds of peoples who are classified as belonging to that particular religious group.

Some 26 million people in India lie outside of ordinary religious classifications. These peoples belong to tribes, with individualistic pagan rites. Generally they include the more Negroid, or Australoid groups of the Deccan and poorer parts of the realm.



India: languages

Second among major religious groups are the Mohammedans, who total 95 million, or about one quarter of the population. These are scattered in a rather complex manner in all parts of India, but have two main areas of concentration: in the northwest and in Bengal, the province that includes the combined deltas of the Ganges and Brahmaputra. It is impossible, however, to outline one, two, or several territorial regions as Mohammedan states without including large minorities belonging to other religions. The political creation of Pakistan is an attempt to do this in a simple, but rough, way.

Other leading religious groups include: 6.32 million Christians, 5.69 Sikhs, 1.45 Jains, 0.232 Buddhists, 0.115 Parsees, and 0.022 Judajists. Some 0.410 remain unclassified or refuse religious affiliation.

Sikhism was founded in 1500 A.D. in the Punjab. It is a highly reformed type of Hinduism that claims to have taken the best parts of each of the leading religions. One God is acknowledged, idolatry is prohibited, caste is abolished, and Brahman supremacy is denied. Few examples exist where religious sects actually practice such virtues as are recognized by Christianity as among the Sikhs, particularly the virtue of charity, which is brought down to such a practical basis that food and shelter are provided in all temples.

Jainism, dating from the sixth century A.D., is another departure from Hinduism in which the Vedas, or ancient sacred literature of the Hindus, are rejected and respect for the lives of animals is carried to extreme lengths.

Buddhism, the one great religion that originated in India to become widely followed in other lands, now occupies a very minor place at home. Originally it was a highly moral religion, advocating Nirvana, an ideal condition of the spirit; freedom from necessity of future transmigration, or passage of the soul at death to the body of another animal or human; and final oblivion to care, pain, or reality. To attain this condition one should follow the "Eightfold Path" of right belief, resolve, word, act, life, effort, thinking, and meditation. Most forms of Buddhism today are highly corrupted and mixed with Sivaism, Shamanism, or other cults, which ordinarily introduce a host of evil spirits, gods, ancestral spirits, and other influences that quite obscure the spirit of the teachings of Gautama.

Cleavages among members of the many religions, the elaborate castes of orthodox Hinduism, and the absence of clear patterns of distribution of religious groups have long prevented the rise of a coherent Indian nationalism. About three quarters of the people of the central river plains and the Deccan are Hindus. About three quarters of Bengal and Punjab are Moslems. In Assam, about half the population is Hindu. Pakistan, the Moslem state, lies beyond the ends of the Ganges plain. India, the area dominated by Hindus, extends southward from Nepal to the tip of the Deccan.

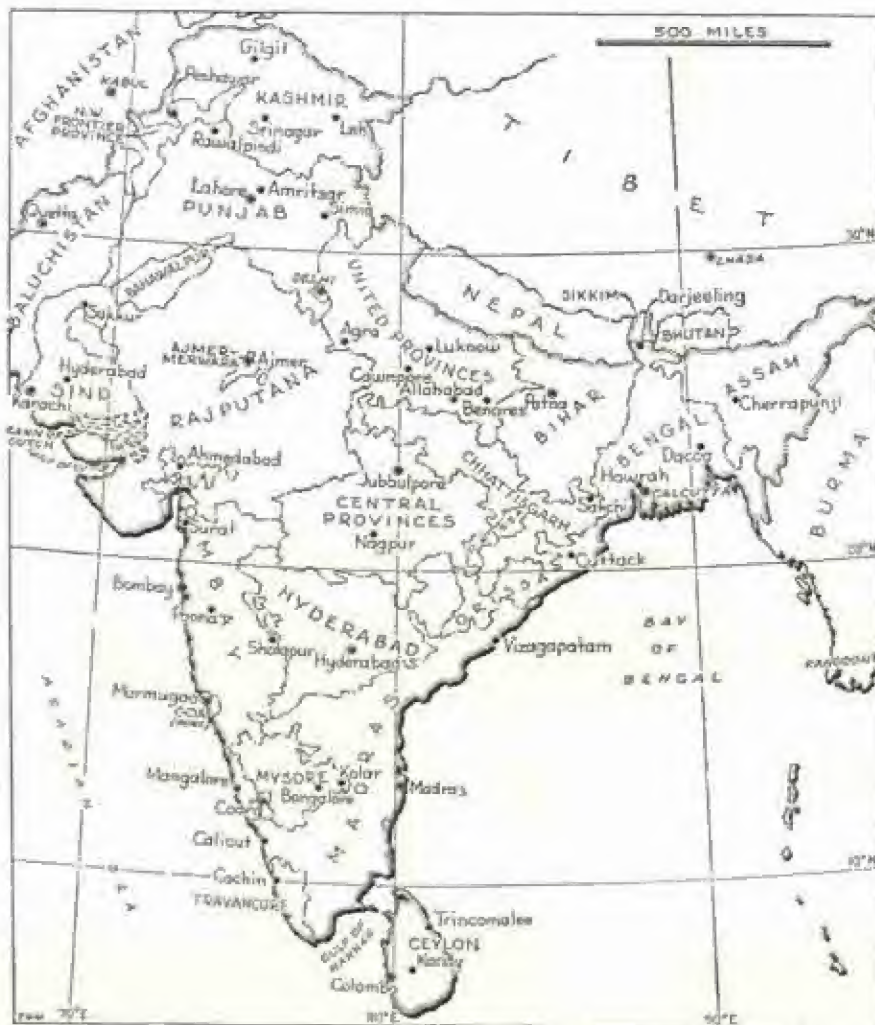
The population of India is approximately 357 million, while that of Pakistan is estimated at 76 million.

42: Hindustan and Elder India

Hindustan, the river plains region of India, is a belt extending from the Arabian Sea to the Bay of Bengal between the mountain borders of the north and the hills and plateaus of peninsular India to the south. This belt juts northward along the Indus Valley toward Kashmir and swings as an arc parallel to Himalayan trends to the border of Burma. It is a lowland consisting of active and former flood plains of the Indus, Ganges, Brahma-

putra, and their principal tributaries. Occupying less than one quarter of India, Hindustan supports well over half of India's population. The entire belt is about 2,000 miles long and from 150 to 250 miles wide. It is broadest in the west, where the climate is arid and few people live.

The Indus, fed by large rivers from northern mountains, flows with diminishing volume toward the Arabian Sea because its course leads through



India: index map

about 500 miles of arid territory, even extreme desert toward its mouth. In Punjab, between rugged Kashmir and dry Rajputana, there is excellent land for agriculture, with ample precipitation at higher levels and adequate water for irrigation at lower. To the east of the lower Indus is desert and steppe, mainly in Rajputana. This Thar, or Indian Desert, separates the lower Indus from the river plains to the east, a break emphasized by the Aravalli Range and other uplands extending north from the Deccan toward Delhi. Punjab is thus an attractive corridor between the mountain borders of northwestern India and the Ganges plains. Its open lands offer good grazing or plunder possibilities. Across Punjab at various times people have come in waves of conquest or migration to one of the world's richest territorial prizes, central Hindustan.

Much land in Hindustan produces two crops per year. The *rabi*, or winter crop, which is harvested in the spring, commonly includes wheat, barley, and chick peas (gram); while the *khari*, or summer crop, which is harvested in the fall, includes various types of millet (grain sorghums, etc.), maize, rice, and cotton. Part of this two-crop agriculture is made possible by the fact that the easternmost effect of Mediterranean winter precipitation extends across Iran and into India. Frontal disturbances between contrasted air-masses are feeble eastward, where streams of cold air are unable to descend from inner Asia to the river plains of India, but they are sufficient to yield a bit of precipitation during what is normally a very dry season for India. This winter precipitation is a subdued *secondary maximum*, that may amount to only an inch or so, but it comes when the winter crop needs it and hence is rather important.

Some 90 per cent of all Indian precipitation falls as a result of the summer monsoon winds. The rivers originating in the north are fed by melt-water from snow and ice as well as by seasonal rainfall, and hence maintain flow at all seasons. Far more important than this runoff in rivers is the huge quantity of *groundwater* that seeps down into the valleys and along them. This subsurface water augments river flow, appears in springs, and is tapped by thousands of wells. Irrigation is an extremely important factor in Indian agriculture. In the Deccan water is impounded for the dry season.

While some snow falls in the Punjab and frosts occur at higher elevations in the river plains, winter is comparatively mild for much the same reason as in Mediterranean Europe or along coastal California; there is no way that extremely cold continental air can reach them. The rate at which air is heated by descent (compressed as it en-

counters higher barometric pressure, resulting from the weight of additional air above it), is somewhat more than 1° F. per 200 feet. Air forced down 20,000 feet, starting with an initial temperature of -50° would end with temperature well over 50° above the Fahrenheit zero. On being forced down, however, the increase in temperature decreases air weight, nullifying the original reason for descent. Air can be forced down several thousand feet if conditions are favorable, but descent such as from the level of Tibet to that of the Ganges Valley is impossible. High mountains thus barricade many lowlands from the continentalism in temperatures that exists in interior regions.

The average temperature for January at Calcutta is 64° F., which is close to tropical. That at Delhi is 58°, which is warm-subtropical, or mesothermal. Winter temperatures in Hindustan are similar to summer temperatures in northwestern Europe. This relatively cool season, however, is short and for this reason the vegetation is quite tropical.

Aside from the arid lower Indus region, the climate of Hindustan is dominated by monsoonal conditions. The cool season ends in February or March. By April, practically all of lowland India has a temperature in excess of 80° F. The spring months of northern climates are coincident with the hot, dry season of India when the thermometer reaches greatest heights. Relief from both heat and dryness comes with the arrival of rather steady monsoon winds that strike with full force the western coast below Cutch and the shores of the Bay of Bengal, continuing inland along the river plains both to the east and west of the Ganges delta. This sharp change comes during June, as a rule. Relief from drought is far more impressive than that from heat, for the temperature actually drops only slightly when the thick cloud sheets arrive. The early part of the summer monsoon is a season of terrific humidity, with sticky, steaming sort of weather. By October the rains stop, skies clear, radiation of heat into the atmosphere is faster, nights become bearable, and average temperatures begin dipping toward the coolness of winter.

High temperatures and concentration of the rainy season in the hot part of the year greatly reduce the value of precipitation to crops. These climatic conditions favor the development of soils characterized by rapid runoff and promote terrific evaporation losses. For these reasons annual precipitation of even 80 inches is favorable, rather than excessive, for agriculture, whereas in the British Isles half that amount is altogether too

much. Places with less than 40 inches are deficient in precipitation in India and those with less than 20 inches become arid steppe or desert.

The Jumna River, which flows through Delhi, is the boundary between Punjab and the United Provinces and the westernmost great tributary of the Ganges. Between it and the Ganges is the principal *doab* (land between rivers) of India. This arcuate and rather narrow wedge stands well above streams. Other *doabs* lie to the east. The general drainage pattern is one in which many streams make broad turns toward the east, meeting others in junctions with narrow points of land between them.

The Ganges flows along the southern side of its valley. The gradient eastward is gentle, averaging only about 6 inches per mile from Delhi to the delta. A slope of 6 feet per mile can not be detected by the eye and few people are capable of noticing one of 10 feet. Where the Ganges leaves United Provinces and enters the province of Bengal, it makes a great bend toward the south. Here it changes character. Upstream it is confined to a

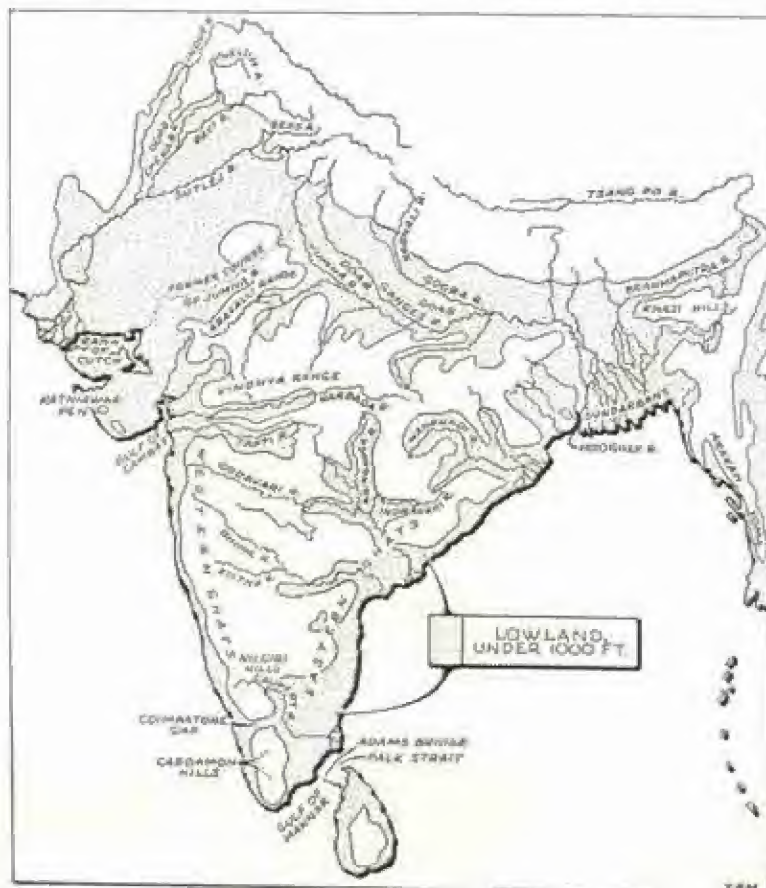
definite channel but in Bengal its course at first becomes meandering (swinging around in great bends) and later braided (dividing into various channels that run between lens-shaped islands of recently deposited sediment). The Ganges erodes its bed upstream, but deposits sediment on its flood plain and delta in Bengal.

The lower Brahmaputra Valley has a flood plain about 500 miles long and 50 wide that is subject to changes in river stage that at times exceed 40 feet. Most of the channel is braided. Alluviation is taking place too rapidly to permit stability in channel position.

From a single cloud sheet over the Manasarowar Lake region of the Himalaya drops of water may fall that are separated on the ground so that some reach the Arabian Sea, if they escape the evaporation so intense along the lower Indus; others may join the Ganges by way of the Karnali and Gogra; while some may be directed around the very circuitous route of the Tsang Po and Brahmaputra. Those coming into the Ganges have an excellent chance of becoming irrigation water and hence serve man well, but the water particles directed toward the Tsang Po are likely to add to man's troubles by being spread widely over the wet fields of Assam.

BENGAL

Bengal, the downstream province of the Ganges and Brahmaputra valleys, has an area of 86,850 square miles (Utah) and population of over 62 million (over half that of the United States in 1940), or an average density of about 730 per square mile, more than Belgium, and nearly that of England. This density might not be so astounding were it not for the fact that in the seventeenth century the region was sparsely inhabited. Bengal has been created by the British, just as Hong Kong was in



India: lowlands and drainage

China. It is hardly appropriate to speak of "returning" either, because neither really existed until the British decided to build them.

The lands and rivers of Bengal were present of course, but they were subject to flooding, unhealthy, and almost unused. Dacca was a place of some importance. The Ganges and Brahmaputra reached the sea through separate mouths until the eighteenth century, when a channel diversion united them. As in the case of most deltas, no real site existed for a commercial port until the British improved the Hooghly and located Calcutta. The conversion of swamp to cultivated land, the control of rivers, the establishment of a huge conurbation, and tremendous growth in rural population does not mean that the British have made any sort of Utopia out of Bengal. It still has one of the worst climates on earth, from which the fortunate try to escape during the most atrocious season to Darjeeling, about 300 miles to the north in Himalayan foothills. It is still expensive to keep the Hooghly navigable for boats that draw more than 20 feet, and entrance is denied those drawing 28 feet, which means that moderately large

freighters can go to Calcutta, but not large warships or great passenger liners. Malaria and disease still take an awful toll. Earthquakes have wrought severe destruction. The head of the Bay of Bengal is built like a gigantic funnel, so that hurricane waves pile up to enormous heights and flood far inland. In 1937 one of these waves, said to be 40 feet high, drowned some 300,000 persons. Large tracts of wet lowland have never been brought into productivity.

The population of Bengal is more homogeneous than that of other parts of India, primarily because it has developed during recent years. Some 90 per cent of the people understand Bengali, and three quarters are Mohammedan, yet they are by no means united in political aspirations. Any suggestion that all of Bengal be made part of Pakistan is accompanied by violent opposition, bloodshed, strikes, and other evidences of fear by people of Hindu faith that Moslems will dominate them.

Luxuriant mangrove swamps cover the *sundarbans*, the many deltaic islands of the river mouths.



Rice fields on the Hooghly River (American Geographical Society)

Salt-water-tolerant, many-rooted, shiny-green, brittle-wooded trees, *sundri*, attain heights of over 100 feet where ideal growth conditions exist. In Bengal they are useful for fuel.

Indigo was the important cash crop of early Bengal. Development of synthetic dyes has ended practically all demand, so that little is raised at present. Over 85 per cent of all cultivated land is now planted to rice. The second important crop is jute, enough to meet almost the demands of the world for the coarse fiber used in gunny (tow) sacks, as linoleum backing, or for weaving burlap. Jute grows rankly in the wetter lands and hence mainly on the eastern side of Calcutta. The great impetus for jute raising came when the Crimean War cut off Russian supplies of flax and hemp.

Calcutta, 2.6 million, is now the second city in India, having been passed in size by Bombay. In Asia both are more than doubled by the populations of Tokyo and Shanghai. With *Howrah*, across the river, it forms a conurbation of 3.0 million, of whom 15,000 are Europeans and a somewhat equal number mixed Indian and European. Until 1912 Calcutta served as capital of India. It is still the financial center and second only to Bombay as a port. Wharves extend along the Hooghly for 20 miles. Howrah is the terminus of important railroads leading up the Ganges Valley and to points in the Deccan. India's greatest center of heavy industry lies not far to the west, where fairly good bituminous coal is abundant. In Calcutta itself are many textile mills, including 90 of India's 95 jute mills, and others that weave silk, which is obtained mainly from China. Calcutta is India's most modern and most European city.

Dacca, 401,000, the old provincial capital, lies upstream in the center of the jute-growing area.

If Calcutta is disregarded, Bengal is 96 per cent rural in population. With the city included it is 93 per cent rural. Myriads of villages cover the province, but few are centers of any size. In spite of the enormous quantities of rice produced, Bengal has been the scene of frightful famines, the scourge of all agricultural countries where population keeps multiplying at rates in excess of food production in bad years.

ASSAM

The lower Brahmaputra province of Assam has an area of 67,359 square miles (state of Washington) and population of 10.9 million, or density of a little over 160 per square mile, so that it is about 22 per cent as densely settled as Bengal. The reason for the smaller density is surplus water,

both in the form of excessive precipitation, as in the Khasi Hills (Cherrapunji), and inundations of flats by rivers. Native populations are rather powerless to use much of the land individually. Most people work under the plantation system, where large tracts are reclaimed and developed under European guidance. For this reason much of Assam is owned and has been developed by the British. The indigenous population was originally largely Mongoloid and lived in primitive ways. As the country developed agriculturally it invited immigration of laborers from Bengal, who have come in sufficient numbers to upset earlier social and cultural patterns.

Assam is still in a pioneer stage of development. Less than 20 per cent is in crops. Lumbering is relatively important. Native elephants and rhinoceroses are still being exploited. Communications are poor, the main lines of transportation being a few railroads and river steamers along the Brahmaputra. Roads are primitive; most streams remain unbridged.

In the original development of Assam it was thought that tea flourished best on hills, the traditional sites of tea plantations. It was discovered later that it thrives as well on flats, so that four fifths is now produced on the lowlands. Rice is the important food crop. Jute is the cash crop toward the delta. Industry is confined almost entirely to such lines as tea packaging, lumber milling, and a few native crafts.

MIDDLE INDIA

Bihar, the United Provinces, and Delhi constitute middle India, the valley of the Ganges and some of the high territory to its north. Together the area is 178,326 square miles (Illinois, Indiana, Ohio, and Kentucky) and the population over 92 million (about two thirds of U.S.), a density of 510 per square mile.

Middle India is the nursery of Indian culture, one of the earliest cradles of civilization, the site of India's oldest and most famous cities, as well as an excellent granary. It was the particular goal of conquerors and its possession was the fundamental strength of India's middle-ages Mohammedan and Mongol empires. In modern times it supports many of India's largest cities. It maintained political leadership over Bengal and other parts of British India.

The many large cities of middle India reduce the proportion of rural inhabitants considerably below that in Bengal or Assam. In Assam, which is without important cities, 98 per cent of the people are rural, whereas in middle India the proportion is 70 per cent.

Toward Bengal the main crops are rice and various millets. Patna, capital of Asoka's Empire in the third century B.C. and now political center of Bihar Province, is the commercial town of the rice-raising region. Here, water buffalo are used to plow fields. Toward the west, where rainfall is less plentiful, the main cereal crops include increasing amounts of wheat and barley. To the west of Allahabad, where the annual precipitation is less than 40 inches, extensive areas are irrigated. About one quarter of all cultivated land in the United Provinces is irrigated, and two crops are commonly harvested per year. Sugar cane and cotton are planted as cash crops. Rice, millets, chick peas, wheat, and barley are food crops. Oil seeds are raised both as cash crops and to provide an illuminant.

Middle India is an excellent illustration of a quite general rule, that in territories richly endowed by nature, most individuals are extremely poor. Like the Po Valley, Egypt, and other fine areas, it has altogether too many people for the majority to live comfortably. Only in rare cases is agriculture particularly profitable to the tiller of the soil. Fertile lands that are intensively farmed generally yield low per capita incomes. Population increases, land holdings decrease in size, and demands on the land become so severe that crop failures bring poverty, suffering, and famine. Even in the United States the per capita incomes in barren Nevada and Utah are well above those of fertile Iowa. The people of the barren Great Plains states have higher individual incomes than those in the more agricultural states of the Southeast. The most extreme forms of poverty exist in such places as the best parts of the Yangtze lowlands and middle India, in spite of the fact that rice may yield five times or more food energy per acre than wheat.

Every improvement, such as the irrigation of 1.3 million acres by the Ganges Canal which has reclaimed much of the doab between the Ganges and the Jumna, tends to stimulate population increase and leads to increasing poverty of individuals.

Every improvement in sanitation or health likewise leads to serious consequences. If death rates were as low as those of England, existing Indian birth rates would increase population to more than 10 billion, or over four times the present population of the world, within a century.

For a densely populated territory, India supports an amazing number of animals which compete seriously with humans for food, and which are not particularly useful. Elephants, which are used a great deal in lumbering and for jungle travel, are minor and not serious. There are possibly 150 million oxen. While they are the most useful beasts

of burden in most of middle India and elsewhere, they consume vast quantities of food and are not put to very good use. A very small number give milk and those in very small quantities. The proportion of bulls is said to run above 60 per cent, because they are heavier and can pull heavier loads. To the Hindus, oxen are sacred, so are never killed or eaten. The Buddhist will not kill any animal for food, lest he take the life of some ancestor. Many of the Mohammedans extend the taboo against pork, which is considered "unclean," to other animals. When the usefulness of Indian oxen is past, they are permitted to live on, and eat. When death overtakes them, no use is made of their bodies. During life, however, they provide the most commonly used fuel of Indian households. There are also some 32 million buffalo, 26 million sheep, and large numbers of camels to compete with man for food and space. While the European conjures schemes for improving the usefulness of Indian animals, contemplating the starting of dairies, improvement of herds, and the like, he meets utmost resistance if he tries to put his plans into effect.

Benares, 356,000, is a sacred city to both Buddhists and Hindus. It contains thousands of Hindu temples and many important educational institutions. Pilgrims bring large sums of money, as to Mecca or Jidda and Medina. Its importance as a route center lies not only in railroads that radiate from the city but also in a bridge across the Ganges and the navigability of the river downstream. Craftsmen turn out artistic wares and excellent brass work, the latter being important because many castes can use only brass utensils for cooking.

Allahabad, 332,000, at the confluence of the Jumna and Ganges, shares certain religious advantages with Benares. Every Hindu hopes either to die, or to be cremated, on the banks of the Ganges. Though a commercial and political center, Allahabad has not made the progress in recent years of several centers farther up the valley.

Cawnpore, 705,000, is the most important industrial city of middle India, with advantages of Ganges and railroad-hub location. Established as an East India Company post in the eighteenth century, it has outstripped ancient rivals and grown into a comparatively modern, Europeanized city with textile factories, flour mills, leather tanneries and factories, sugar, oil-seed, and chemical industries. Population doubled in the last ten years.

Lucknow, 497,000, capital of United Provinces is a center for paper manufacturing and printing, with many agricultural industries. It has long been

famous for craftsmanship, especially in gold and silver articles. India is given credit for having absorbed 60 per cent of the gold and 40 per cent of the silver that has ever been produced. No other territory has such a mania for hoarding. The masses of India have little knowledge of banks or of saving in any form except the accumulation of gems or precious metals.

Agra, 376,000, capital of the Mogul Empire under Akbar, Shan Jahan, and other great Indian emperors during the sixteenth and seventeenth centuries, and finally taken by the British in 1803, is the site of the Taj Mahal, usually considered as the climax of Mogul architectural endeavors. Old crafts, such as inlaying marble, making of mosaics, and gem setting are being replaced by modern forms of industry.

Delhi. Above Agra on the Jumna is Delhi, 915,000, capital of India since 1912. Though Delhi has somewhat better climate than Calcutta, it has a mountain retreat in Simla, some 150 miles to the north at an elevation of over 7,000 feet, the hot-weather capital of India. Delhi has been an important route center for many centuries. Originally it was the head of navigation on the Jumna, the place where goods were transferred from boats to animal backs for transportation to the west. The demands of irrigation have now lowered Jumna waters so that this particular advantage has been lost. Delhi remains, however, the gateway between middle India and the Punjab corridor, between the mountains and the desert. It also lies within 1,000 miles of Calcutta, Bombay, and Karachi, India's principal ports, and not much over that distance from Madras. Industrially it processes agricultural materials and weaves textiles, particularly cotton.

PUNJAB

Beyond the Jumna lies Punjab, land of five rivers, the Sutlej, Beas (Bias), Ravi, Chenab, and Indus. It is somewhat chevron shaped, running northwestward from United Provinces toward southwestern Kashmir and from there southwestward along the Indus, fronting against the North West Frontier Province and Baluchistan, embracing an area of 137,235 square miles (slightly less than Montana) and a population of nearly 30 million, or slightly over 450 per square mile.

The plains of Punjab receive about thirty inches of precipitation toward the east and fifteen or less toward the west. Wheat is the leading cereal crop and amounts to 45 per cent of that raised in all India. Half of the wheat is irrigated. Various millets are also raised as food crops. Cotton and sugar

cane are cash crops. The cotton is in particular demand because much of it is the American variety, with relatively long staple, whereas most other Indian cottons are native and have staples so short that they can be used only for the cheapest fabrics.

Irrigation is extremely old in Punjab, some of the dams built during early times being important works of art as well as of utility. Much water is supplied by wells, enough to irrigate over 3 million acres, using devices ranging all the way from simple lifting buckets to modern pumps for bringing it to the surface. Under British control several important dams were built, including the great Sutlej Valley Dam completed in 1932, which irrigates 10 million acres. Half of all the irrigated lands of India are along the Indus and its tributaries, most of which no longer flow into the Indus. These works have permitted an enormous increase in population.

The people of Punjab are more purely Caucasian than other Indians. They are taller, make excellent soldiers, and exhibit the same feeling of superiority over other Indians that many Oriental wheat-eaters display toward rice-eaters. Only 60 per cent of the population is dependent on agriculture. Those engaged in industry amount to 20 per cent, whereas in United Provinces the figure is 11 per cent and in Bengal 8 per cent. Many carry on commercial and financial activities that include journeying all over India, peddling, and money lending.

While most of the population is Mohammedan, the Sikhs are a particularly noteworthy group. Comprising about one eighth of the population, they own one quarter of the irrigated land, formed about one quarter of the recruits of the British-Indian army, and serve as police in cities throughout the Far East.

Lahore, 849,000, is the main Mohammedan center, with important textile industries specializing in cottons and woollens. Nearby *Amritsar*, 391,000, with the Golden Temple sacred to the Sikhs, makes excellent rugs from Tibetan goat hair; other carpets and rugs; textiles of various sorts; copper, gold, silver and brass wares; and pottery. Multan is the main route town of the southwest, with railroads to Karachi, Peshawar, Quetta, and various Punjab points.

There is some petroleum in Punjab, as there is in Assam, but to date the amount produced is small.

THE DRY WEST

Rajputana, giant among former "agencies" of native states, 132,559 square miles (almost as

large as Punjab); tiny Ajmer-Merwara, a province of 2,400 square miles (Delaware); and the province of Sind, 48,136 square miles (Louisiana), have a combined population of 18.8 million, of whom 13.7 are in Rajputana. Average population density means little because many people are concentrated in a few irrigated regions and much of the desert is practically uninhabited. The average density of somewhat over 100 per square mile in Rajputana and Sind is extremely low for India and is an expression of the aridity of the Thar, or Indian Desert, which extends eastward from the Indus toward a line between Delhi and the Gulf of Cutch.

Sind and most of Rajputana are notably arid. In the vicinity of Sukkur, in northern Sind, the annual precipitation is about four inches. There is an extensive area with less than five and comparatively little with more than ten or twelve. The whole region lies beyond the northern limits of the monsoon winds that strike the west coast. Summer temperatures are high, averaging nearly 100° F. during the month of June, with many days in the neighborhood of 120°. Camels are the main beasts of burden and much territory is too dry even for pastoral nomadism.

The Indus has practically no value for navigation and carries so much sediment that its course has been subject to wide shifts and diversions. Within historic time it has abandoned an eastern channel, below Hyderabad in Sind (not the important city and state of the Deccan), which led it toward the Rann of Cutch, in favor of a more westerly channel. Indus water, however, provides an elongate oasis between Punjab and the Arabian Sea. Formerly this oasis was more important from the route standpoint than for supporting agriculture. Extensive improvements have now controlled the river fairly well, so that large tracts have been brought under cultivation. The dam at Sukkur, completed in 1932, supplies water for over 5 million acres, where long-staple Egyptian cotton can be grown. The main food crop is rice.

Karachi, 1.1 million, capital of Pakistan, ranks third among Indian ports. It is slightly closer to Aden than is Bombay and serves as the main outlet for Punjab. Cotton and wheat are leading exports. Location is west of all mouths of the Indus in order to escape sediment, and rather poor natural port facilities have been overcome by the building of a breakwater. Recent years have seen notable development of facilities for air transport, Karachi being a main base on routes from England to India and Australia.

The Jumna, which now swings through Delhi to become one of the main tributaries of the Ganges, formerly flowed along the northern side of the

uplands along the Aravalli Range, along the eastern borders of the Thar, and into the Rann of Cutch. The ruins of oasis settlements dating from extremely early times up until about 3000 B.C. follow the old course. As in the case of the Tarim, a river diversion rather than climatic change forced the abandonment of what had long been an important route and the agricultural settlements along it.

The Rann of Cutch is the abandoned delta of the old Jumna and Indus combined. For thousands of years heavy loads of sediment built lands that extended around uplands northwest of Kathiawar Peninsula. When the sources of sediment were diverted to other channels, the abandoned delta continued to sink, so that today much of it is submerged when tides are high or wet seasons contribute surplus waters. It is a scene of present-day geological activity and has witnessed important earthquakes of local origin which are expressions of imperfect adjustment to loading. In 1819 an extensive area sank over 10 feet, while a broad region nearby was elevated several feet.

The northeast part of Rajputana extends into territory of steppe climate, where rice, wheat, and cotton are irrigated. For thousands of years people of the dry west of India have carried on farming based on water from wells inadequately supplied by subterranean seepage. At first such wells provided nicely for local needs, but exhaustion of water at rates greater than inflow gradually lowered the *water table*. Longer lifts and more expensive irrigation in time caused abandonment. The ruins of these marginal agricultural failures dot the country. A careless interpretation of this record in which the populations of all are considered as contemporaneous would suggest desiccation that really hasn't taken place at all. Even the excellent reclamation projects of recent years, the dams and ditches that render much of upper Rajputana useful today, are hardly permanent. Salts accumulate in soils, reservoirs clog with silt, and eventually many areas face abandonment. The saline playas of the Thar represent the same fundamental pattern; terminal basins of dry-climate drainage become saline or fill with sediment.

ELDER INDIA

The peninsular part of India is elder India, not from the standpoint of Indian history, but from that of European contacts. It was from Ceylon and the Deccan that products first reached the Egyptians and peoples of the eastern Mediterranean. It was here that activities of the Portu-

guese, Dutch, and French were centered in the early days of Europe's Commercial Revolution.

From the geological standpoint the Deccan is similar to Africa south of the Sahara, a region of rather monotonous history and crustal inactivity. In the south are extremely old rocks, much like those of Africa. In the central and northwest are extensive coverings of rather ancient lava, above the old rocks, layer upon layer, over an area of some 200,000 square miles, which is considerably more than that of California. The lava flows are still about horizontal. Individual layers form flat benches which lie above one another, separated by abrupt scarps. Similar *mesa* topography is characteristic of places covered by rather flat lavas in the Columbia Basin of the Northwest, in parts of New Mexico, and elsewhere. These tableland landscapes are quite unlike those of parts of the Deccan not covered by lava, where hills of ancient rock are rounded in crest and contour. Deccan rocks contain many useful minerals, some in rather great abundance. On the whole, however, India is not a mineral-rich land.

The peninsula of India is roughly an isosceles triangle with sides about 1,250 miles long and an inland base about 1,000 miles wide. This dissected plateau, over 2,000 feet high in the south and west, is tilted gently eastward. The Mahanadi (north), Godavari, Bhima, Krishna, and other streams that flow into the Bay of Bengal drain most of the surface. In the north, however, are two important exceptions to the rule; the Tapti and Nerbada flow westward, toward the Gulf of Cambay. The valleys of these rivers mark changed conditions in topography: the introduction of east-west lines of hills that have considerable significance as topographic barriers toward Hindustan. Among these the Vindhya Range, to the north of the Nerbada, and the Mahadeo to the south, have served to check expansions of various national states of the river plains southward into the Deccan.

The Western Ghats rise abruptly from a narrow coastal plain along India's west coast. Summits attain elevations in excess of 4,000 feet at several places in the north and 9,000 in the Nilgiri Hills, east of Calicut. This crest of the Deccan is like that of Arabia, which rises abruptly above the Red Sea and slopes rather gently toward the Persian Gulf, and is highest in Yemen. There is a terrific contrast in precipitation. The Western Ghats catch the full brunt of the southwest monsoon and are excessively wet. Places at sea level get 100 inches and over, those at elevation 200 and 300 inches. Though the average annual pre-

cipitation at Bombay is on the order of 75 inches, it once received 540 during a three-month period.

There is *rain shadow* behind the Western Ghats. As winds which have dropped so much moisture start down the slope toward the Bay of Bengal, heating tends to evaporate the clouds, so that annual precipitation of less than 40 inches is rather general and a few spots get less than half that much. Various millets are raised as food crops in these drier places, whereas rice is the leading cereal in all places with over 40 inches. In order to conserve water, peoples of the plateau dam thousands of small ravines and depressions, forming small reservoirs, like the *tanks* of west Texas. Villagers water their animals, fish, wash clothes, dump refuse, and drink the water in these tanks.

The eastern scarps of the plateau are called the Eastern Ghats. Their continuity is broken by many wide valleys and elevations are much lower than those to the west. Rainfall in excess of 60 inches occurs to the north of the Godavari River, coming with the summer monsoon which blows from the south up the Bay of Bengal to spread both eastward toward Assam and westward toward the Ganges Valley, across the northeastern Deccan. Along the Coromandel Coast, which runs about north-south along the meridian of 80° E., there is considerable winter rainfall; the *fetch*, or distance, across the Bay of Bengal being sufficient to moisten the otherwise dry winter wind from the continent.

CEYLON

There are two considerable uplands in the southern Deccan, one of which is detached, and the other of which remains part of the mainland. The Cardamon Hills, which lead to Cape Cormorin, and nearby Nilgiri Hills are safely on the mainland of Asia. Ceylon, which culminates 8,279 feet above sea level, is an island with an area of 25,332 square miles and population of 7.6 million. It is somewhat under 300 miles long and about the size of West Virginia but has considerably more than twice the population. Formerly administered by the Madras Presidency, it was made an English Crown Colony in 1802, and became a dominion in 1948. It was not part of British India.

There are a few Veddas in the hills of Ceylon. These people supplement primitive hoe culture with hunting, in which they are expert with primitive weapons. Singhalese, a mixed Dravidian-Mediterranean people, invaded Ceylon in about 1000 B.C. to become its dominant people. They are now Buddhists. Hindus and Tamil-speaking people from southern India are more recent immigrants and plantation laborers.

Ceylon is the nearest British equivalent of Dutch Java. About one fifth of the island is under cultivation, mainly in plantations. Once important as a producer of coffee, it is now an important source of tea, which thrives in wet highlands, where some places receive as much as 150 inches of rainfall annually. Even more acreage is planted to rubber than to tea, but the monetary return is less. Cardamom, cloves, and cinnamon are among exported spices. Citronella, an oil which repels insects, is produced from a native grass. About one fifth of Ceylon is forested with tropical evergreen trees. Coconut palms grow on the lowlands, valuable for dried flesh, oil, and fiber, *coir*. The best coconut plantations are along the sandy west coast. Better lowlands produce two crops of rice, one with each monsoon. A great deal of the lowlands is scrub-jungle. So great is the concentration on plantation crops that the island has to import food.

The main mineral resources are natural graphite and precious stones, which may be polished to become gems.

Colombo, 388,000, is entered by more ships than all the ports of India combined. In addition to being the commercial and export center of Ceylon, it is one of the world's important coaling stations, the supply coming mainly from Wales. There is practically no variation in temperature between January, the least hot, and May, the month of maximum temperature. Temperatures are never far from 80° F. Kandy, center of the tea district, is 72 miles by rail from Colombo and is an important city to Buddhists, containing the Temple of the Tooth. Trincomalee, to the north, is a British naval base, one of those strategic on "south tips" of the earth's lands.

Adams Bridge is a natural connection between Ceylon and the mainland, quite similar to the Florida Keys. Railroads run both from India and Ceylon to a central gap of 22 miles, which is ferried. It is said that this break originated during a storm in 1480 A.D. It would not be difficult to trestle the distance as the water is shoal. To the south, in the Gulf of Mannar, are good pearl fisheries.

The coastal inhabitants of Ceylon are skilled seamen in outrigger canoes, similar to those of Malaysia, Madagascar, and the Pacific islands.

MALABAR COAST

Along the western side of the southern Deccan is the wet, tropical Malabar Coast, which like Ceylon was an early source of spices. Travancore, which extends west from the summits of the Cardamon Hills, has a population density in excess of 780 per square mile, and in Cochin, to the

north, it is over 950. A wide coastal plain produces an abundance of rice, sugar cane, coconuts, and some rubber. Various millets, plantains, mangoes, cotton, and spices grow at higher elevations. The upper slopes are heavily forested. Quinine and considerable tea are grown above 3,000 feet.

The coastal population derives much of its support from fishing. Many of its men become *lascars*, sailors on British merchant ships. Calicut, Mangalore, and other centers of early trade have declined, but there is considerable revival at Cochin, where facilities for modern ships have been provided. Two railroads connect with the east coast, one through the Cardamon Hills and the other through the low gap of Coimbatore, just south of the Nilgiri Hills. Copra, coir, coconut oil, and tea are leading exports.

The coast northward is deficient both in harbors and coastal plain. The population of Coorg Province, just north of the Malabar part of Madras, has a density of little more than 100 per square mile, an expression of ruggedness of topography and excessive rainfall. Goa, in Portuguese India, has a railroad leading up the face of the Western Ghats that is said to have cost a human life for each tie, so rife was disease during the time of its construction.

COROMANDEL COAST

Madras Province and states cover an area of 127,768 square miles (more than New Mexico) and have a population of nearly 50 million. These political divisions extend along the Coromandel Coast, north of Ceylon, and somewhat farther up the Bay of Bengal and also reach the Malabar Coast, north of Cochin. An average population density of about 400 per square mile results from much greater densities to the south and lesser to the north. Several French possessions are scattered along the east coast. These are small and of little economic importance at present, although once they sent important luxury items and textiles to Paris in sufficient quantity to help materially in establishing it as Europe's leading center of fashion.

Originally important as a source of pepper, jewels, gold and silver objects, and ivory, the Coromandel Coast now exports hides, leather, vegetable oils, tropical woods, such as teak and sandalwood, and cotton. Oil is obtained from flax (linseed), rape, mustard, sesame, coconuts, and peanuts. Tobacco and sugar cane are important cash crops. Rice and various millets are leading cereals. Leather industries are favored not only by

the abundance of cattle and sheep on farms and in the hinterlands of the plateau, but also by the presence of good tanbark.

Madras, 1.4 million, is India's third city and ranks fourth among its ports. It is prosperous, modern, and Europeanized, in spite of being only 13° 5' north of the equator. As a textile center it supplied the name of a fine fabric commonly used for dresses and shirts. Textile industries have specialized on cotton, and other industries on agricultural processing. There were few natural endowments for the port, but a productive territory with a rather energetic and advanced population furnished trade enough to justify the building of an artificial harbor, modernized in 1933, and dredging an inland waterway along the coast, the Buckingham Canal. The entire east coast of India is deficient in harbors, Vizagapatam, to the north, being the only fairly good port south of the Hooghly.

The valleys leading to the east coast have wide flood plains that are relatively fertile and highly productive. Improvements in the Cauvery, the

main stream just north of Palk Strait, have thrown large areas open to the cultivation of rice.

Though the percentage of Dravidians is high along the east coast of India, Tamil being the most widespread language, the population of Madras Province is comparatively progressive. Nearly one third are literate and English is widely understood. About 90 per cent of the population is Hindu, and Christians outnumber Moslems.

SOUTHERN INTERIOR

Mysore, 29,458 square miles (South Carolina) and population of 9.0 million, and Hyderabad, 82,313 square miles (Idaho) and population of 18.7 million, have a population density of about 250 in Mysore and 200 in Hyderabad. These have been the two great native states of the Deccan. Their populations suffer from poor soils over large areas, especially to the south.

Tropical climate with heavy rainfall and sufficient relief to promote adequate drainage results in severe leaching of rock. Such soluble materials as lime disappear very rapidly. Silica is very slow in disappearing. Some forms of iron are even less



Agricultural village, northern Madras (American Geographical Society)

soluble. After many millions of years and only under hot-wet conditions, the most insoluble substances in rock, hydrous alumina silicates, are all that remain. They are either gray, mottled gray and reddish or yellowish, or commonly reddish, the colors being due to iron stains. This extreme product of leaching is a rock called *laterite*. When damp it is excavated quite readily, but in blocks exposed to air it hardens and forms excellent building stones that are widely used in southern India, southeastern Asia, and other tropical lands. As parent material for soil, laterite is the most deficient in plant nutrients. Lateritic soils cover much of the southern interior of India. The rank growth of vegetation on them indicates how important climatic conditions are in controlling plant life. People should be very careful not to confuse fertility and productivity. Many lateritic soils are highly productive, but they are among the least fertile, whereas the materials that cover deserts are generally fertile, but unproductive. Saline flats, of course, are sterile, not fertile.

The productivity of lateritic and other poor soils of the tropics is best exemplified by tropical rain forest, and quite well by the monsoon forest. When plots are cleared a useless second growth of tropical scrub is likely to take over. In most densely populated tropical countries these rather barren plots are widespread in landscapes.

Mineral wealth occurs in some parts of the Deccan. Gold has been mined for many centuries at Kolar, to the west of Madras. The workings now extend over 3,000 feet below the surface. It also occurs in the Nilgiri Hills, south of Mysore. The most productive mineral regions are in the northeast, in northern Madras and territory to the north. Copper, iron, and manganese are mined in considerable quantity, the latter being exported from Vizagapatam. About three quarters of the world's sheet mica comes from Madras and Orissa provinces.

Hyderabad, 1.1 million, is the greatest city of the southern interior and was the most important capital of a native state. Its ruler was said to be the richest man in the world, possessing \$1.5 billion in jewels alone. The capital is a city with oriental splendor, far less European than Madras or cities of Hindustan. It is a center of Deccan culture and craftsmanship, with many people skilled in carving ivory, setting gems, and similar trades. *Bangalore*, 779,000, capital of Mysore, is similar, though less magnificent in exemplifying the native architectural styles of the Deccan.

The Central Provinces, north of Hyderabad, with their many complicated subdivisions, cover 98,575 square miles and have a population of 16.8 million, a density of practically 170 per square

mile. Toward the northeast are poor lands, rough in topography, deficient in fertility, where population density falls to 100 per square mile. Here exist remnants of pre-Dravidian and Dravidian populations that are comparatively backward. Rice is raised in valleys. Maize, legumes, millets, and oil-seed crops creep up gentler slopes. Steeper slopes are forested. Agricultural land amounts only to 10 per cent of the area in some districts. Sheep and goats are grazed in scrub and other relatively barren tracts.

REGUR REGION

The parts of Bombay, Hyderabad, and Central Provinces between the crest of the Western Ghats and the Wainganga River, from roughly the Nerbada Valley south to the Kistna, excluding some of eastern Hyderabad, form the *regur* or black-soil region of the Deccan. Two facts are responsible for the development of fertile soils over much of this area. The ancient rocks are covered by lavas, which tend to weather into a parent material rich in certain plant nutrients. The climate is one that favors grass, rather than forest, a crop that adds much organic material to soil in the form of roots. Regur soils are similar in many ways to the Chernozem, or black earth, of the region just south of the mixed forest in European Russia. They are capable of producing good yields for many years of planting to such demanding crops as cotton or wheat.

The owners of the best soils in the interior of the Deccan are far more Caucasoid than the peoples on the barren lands farther east, beyond the eightieth meridian. They raise millets and wheat for food, and for income such crops as oil-seeds, sugar cane, opium poppies, and, most important of all, cotton. Two thirds of India's cotton acreage, covering an area of over 25,000 square miles, lies in the regur region. The per acre yield is poor, the quality inferior, with very short staple, but the aggregate output is enormous.

Sholapur, 300,000, *Poona*, 481,000, and *Nagpur*, 449,000 are commercial centers and railroad junction cities in the cotton district. The general movement of cotton is westward, to the mills of Bombay and Ahmedabad, although considerable milling is done at *Jubbulpore*, a city of 200,000, toward the head of the Nerbada.

BOMBAY

The Nerbada and Tapti converge toward Surat, on the Gulf of Cambay. During the days of Portu-

guese supremacy in Indian trade this city was the leading export center of India. Like Bristol, however, its harbor proved inadequate for ships of more modern time, so the center of activity has shifted southward to Bombay.

Bombay Presidency, 111,394 square miles and a population of 35.9 million, has a density of about 300 per square mile. The city of Bombay, 2.84 million, has recently passed Calcutta in India. It is located on an island where congestion is extreme. One third of the population lives in single rooms that are shared by six or more people.

Though ceded to the British by the Portuguese in 1661 and established as headquarters of the East India Company in 1708, Bombay was comparatively slow to rise. The Caucasoid Marathas and other relatively advanced peoples, who held the best parts of the regur region, were not readily subdued by the British. It was long before railroads could open up communications with the interior. The main impetus to Indian cotton raising, like that of Egypt, came with the war between American states in the early 1860's. Bombay received another great boon when the Suez Canal was opened toward the end of that decade. Today some 250,000 people work in Bombay cotton mills and tend 40 per cent of India's spindles and half of its mechanical looms. The moist air, though unpleasant to Europeans, is excellent for cotton manufacturing. Deficiency in coal resources is to some extent overcome by cheapness of imported supplies and to some degree is ameliorated by the development of hydroelectric power. Not only many factories but some of the railroads are run by electricity. The role of Bombay at first was that of an exporter of raw cotton and importer of finished cloth, from English mills. At present it has served to materially reduce the dependence of India on England for textile products of various kinds.

Bombay is the center of native Indian finance, whereas Calcutta is the center of British commercial activities. Among the wealthy people of Bombay is a particularly interesting group, the Parsees, who fled from Persia during the seventh and eighth centuries to escape Mohammedanism, carrying with them a type of Zoroastrian religion which they retain today. After spending some time in Punjab, most Parsees drifted to Bombay. Their religion is notable not only in not having missionaries or advocates who hope to sway others to conversion but also in that it accepts no recruits; one must be born a Parsee.

The main routes to Bombay descend from the Deccan through passes about 2,000 feet high. Not

only do they bring cotton, but oil seeds and various other products for export.

Ahmedabad, 788,000, once a Mogul capital, is a second Bombay in that it manufactures cotton cloth as a specialty. It has grown at an amazing rate, trebling its population since 1900, adding many industries of various kinds.

NORTHEAST INDUSTRIAL REGION

About 150 miles west of Calcutta is India's center of heavy industry. About 90 per cent of India's bituminous coal is concentrated in the northeastern Deccan, in rocks somewhat younger than those of most of the peninsula to the south, but older than the Deccan Traps or the lavas of the regur region. There are coal outcrops to the south, along valleys, but they are of minor consequence. The northeast also has excellent iron resources, probably the most important reserve in all Asia, in the small state of Bonai, northwest of Cuttack somewhat over a hundred miles. Other iron deposits lie closer to Calcutta.

Sakchi is the center of industrial activities, containing the only large modern iron and steel mills in India, and producing large amounts of the cheapest pig iron in the world. An abundance of coal is mined in the Damodar Valley, to the north a short distance, and iron ore is supplied in the vicinity and to the south.

India is deficient in zinc, lead, and tin, although the world's most productive sources of the latter are not far to the east. It also suffers from shortage of scrap iron for making steel. There is little likelihood that India will become a great industrial country in the visible future, but such start as has been made is close to Calcutta and densely populated Bengal.

ECONOMIC POSITION

The vast population of India, about double that of the Soviet Union and 280 per cent that of the United States, though low in per capita efficiency, has weight enough to influence all comparative statistics of production, import, and export to a considerable degree. Indian trade, which has been carried mainly in British ships, has been an extremely important item in maintaining Great Britain's population. Whatever future political control the British may keep in India, loss of India's commerce would severely cripple England's financial position.

About 90 per cent of India's population is rural and about 80 per cent of all arable land is in use, 20 per cent of it being irrigated. Although Karachi often exports considerable wheat, there is not

enough food raised to keep the population well nourished. Tea is the main cash crop. Cotton, jute, linseed and other oil seeds, rubber, and various other agricultural products are exported in large quantities. Millets occupy 30, rice 25, wheat 10, cotton 7, and oil seeds 7 per cent of cultivated land. About 20 per cent of India is in forest, not useful forest as a rule, but from it come sandalwood, teak, deodar, satinwood, palmwood, banyan, and acacia.

The iron, manganese, and mica supplies of India are abundant. There are large amounts of fairly good coal, some petroleum, and many other minerals in moderate abundance.

The main industrial districts center in Calcutta, Bombay, Ahmedabad, Cawnpore, Madras, Lahore, and several places in the Deccan. Almost all activity is centered on textiles, especially cotton and jute.

Though the impact of contact with the British and other European peoples has changed India a great deal in such directions as creating trade, development of natural resources, stimulation of agriculture, and the introduction of modern industrialism, it has not gone very far in changing the

medieval outlook of the great masses of the Indian people. Most people live in villages quite unserved by modern conveniences of any kind and quite separated from changes that Europeans would regard as progressive. In a thoughtless kind of way, peoples here and there take advantage of newly irrigated tracts of land or change their activities in such a way as to benefit from new opportunities in industry or trade, but the average member of the population has not attained any higher standard of living. His span of life has not been lengthened, nor his chances to become literate improved to any appreciable degree. The mind of the Indian is likely to be concerned more with the intangibles of religion and philosophy than with practical affairs of daily life. The barrier against Europeanization so firmly established in Indian mentality is the very essence of the reason why the earth is divided into cultural worlds. Indian culture traits are mainly those of southeastern Asia, territory that is not only far distant in miles from the North Sea but which also lies far away in terms of ideals, practices, and attainments.

43: Central and Southern China

The pre-1928 flag of Chung-Hua-Min-kuo, the Republic of China, had five stripes, representing China proper, Manchuria, Mongolia, Tibet, and Sinkiang. This "Greater China" has an area of over 4.3 million square miles and a population estimated by the Chinese as being in excess of 475 million. No exact census has ever been taken and some experts regard the estimate as being 100 million too high. Greater China covers nearly one third of Asia, extending about 3,000 miles east-west and about 2,400 north-south. Its population is roughly one sixth of the world's and possibly three times that of the continental United States. Over 20 million are "primitives" who differ considerably from the Chinese.

Under some dynasties China has expanded, northeastward across Manchuria or northwestward toward Lake Balkhash. Under other governments China split into numerous political divisions, commonly uncemented by bonds of central authority.

China proper, consists of 18 provinces with an area of about 1.4 million square miles (over half of the U.S.A.) and a population which probably does not exceed 325 million, and possibly may be considerably less. Some 350,000 foreigners, of whom two thirds were Japanese, were present prior to World War II. Among Europeans were 73,000 Russians, 11,000 British, nearly 7,000 French, and a similar number of Americans. The number of foreigners, especially Japanese, increased tremendously during the war.

The commonly accepted estimate of 175-per-square-mile population density has little meaning. Extensive areas in mountainous and Dry World territory are practically uninhabited, while in the province of Kiangsu, where Shanghai is located, nearly 37 million people are concentrated in an area of less than 42,000 square miles, a density of over 880 per square mile; equivalent to about one quarter of the population of the United States being crowded into an area smaller than Louisiana. Over half of China is unsuited to agriculture; 20 per cent is too rugged for habitation, 20 per cent is in forest, a large area has either dry steppe or desert climate, and 16 per cent has an elevation in excess of 5,000 feet. About 10 per cent is plain

and a similar amount low, hilly land. Roughly one third of China is mountainous and another third is plateau. Only one eighth of the country is cultivated, half of which is planted to rice. Population density near agricultural villages commonly exceeds 1,000 per square mile.

The average square mile of cultivated land produces food enough to maintain 3,000 people, and the finest land can support about twice that many. With less than one-half acre tilled per person and little hope of adding land that will produce good harvests of cereal crops, China has difficulty in feeding itself. An annual population increase of 5 million outstrips agricultural potentialities. If the Chinese were allowed to emigrate freely to Australia, that small continent would be unable to feed itself within five years if the rate of emigration were just equal to the surplus of births over deaths in China. Famines of various kinds have killed about 100 million during the last century. Wars may have claimed a similar number.

CULTURE BACKGROUND

Some fifty centuries ago China was probably inhabited by barbaric tribes of primitive Caucasoids from whom have descended many of the non-Chinese resident in southeastern Asia today. Ancestral Chinese appear to have developed somewhere in the vicinity of the great bend of the Hwang-Ho, north of the Ordos Desert.

Yao the Great, a legendary figure, is supposed to have been the first ruler during the twenty-fourth century B.C. A mythical Hwang-Ti dynasty may have existed even earlier. By the twenty-third century there were about 10,000 hsein (districts) united by bonds of common religion and culture. Political control rested with families and religion consisted chiefly of ancestor worship.

Historic time really began with the Chou dynasty, founded by Wu Wang in 1100 B.C. and which lasted until 255 B.C. China became 22 feudal states which covered the area of existing Shansi, Shensi, Hopeh, and a strip of Shantung provinces. The first serious attempt to unify China politically occurred under Ch'in Shih Wang Ti, first emperor of the Ch'in dynasty, who abolished

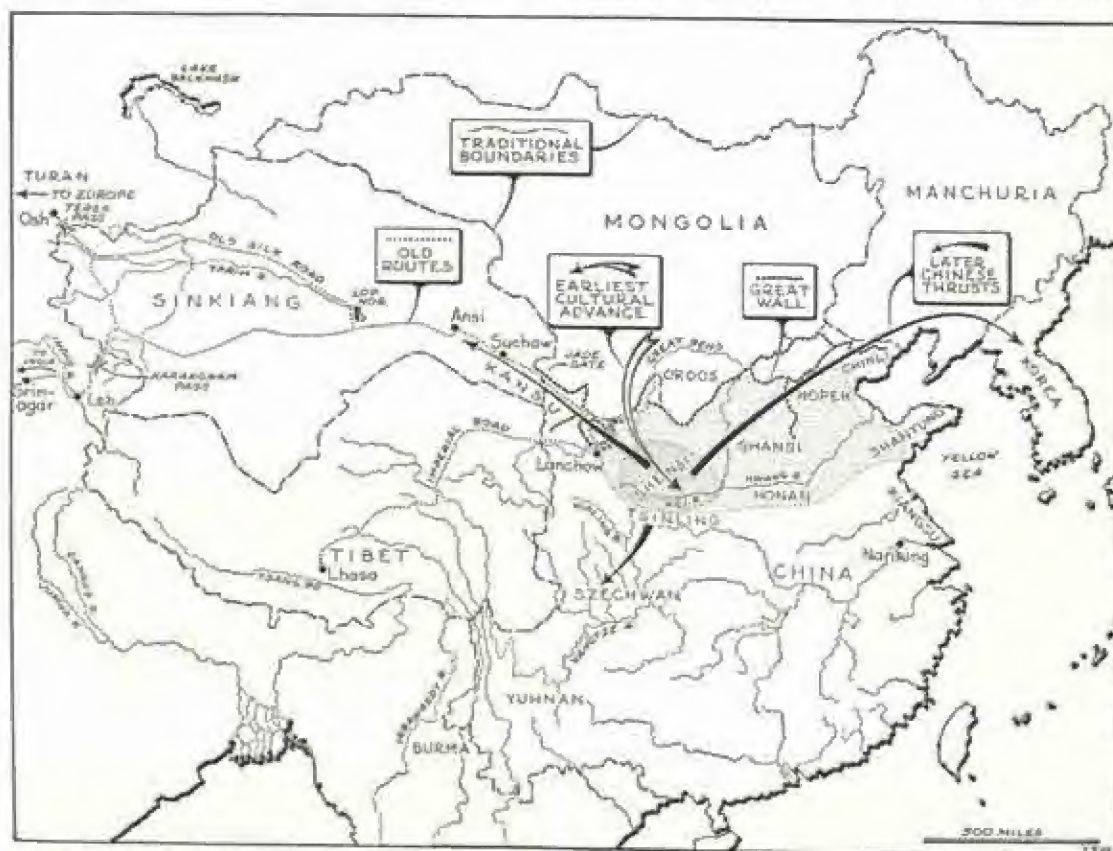
feudalism in 209 B.C. and started the Great Wall in an attempt to keep back possible invaders from the Dry World.

Chinese culture exhibits many Dry World traits. The cult of the family, patriarchal control, a high degree of literacy if only for the purpose of recording family history, and the absence of a caste system are more suggestive of the Dry World than of Indian Realm cultures. Adaptability, keen insight as to the best use of land, and skill in gardening suggest oasis dwellers. Excellent geographical sense in picking routes or in giving directions in such terms as "turn north" instead of "turn left," suggest the leader of the caravan, who perishes if he makes a serious mistake. With minor exceptions the Chinese have failed to practice forestry, a fact that has left the country short of fuel and other wood. Rice straw, brush, grass, and animal dung are poor substitutes. As traders and merchants the Chinese have few peers, most of whom reside in the Dry World. Even during antiquity they were carrying goods across the dry heart of Asia or

down into Burma, and encouraging the use of silk, their principal export, among people as remote as the Romans. Chinese who came into contact with Malay seamen, in about the second century A.D., took to the sea as readily as the Arabs of Oman at some earlier date. Most Chinese, like most Dry World peoples, remained pure landmen.

Shensi, and particularly the Wei Valley, was the culture hearth of the historic Chinese. There the Ch'in grew wheat and millet, the former having been introduced from Persia at some early date. By the eighth century B.C. they were skilled in the use of iron. To the ancient Greeks they were known as the people of Seres, the producers of silk, most luxurious of textiles. Chinese envoys reached Bukhara at least as early as the second century B.C., and Marcus Aurelius sent a representative to China in A.D. 196. Chinese silk and porcelain went westward, even to Roman Britain, along the Old Silk Road across Tarim Basin.

By the second century B.C. the Chinese were thoroughly established as far east as the Yellow Sea, southward to the Yangtze, and westward to the Kialing River of Szechwan. Population was



Nuclear China: routes and thrusts

concentrated in the Wei Valley and Szechwan. The occupation of other parts of China proper, however, was accomplished slowly. Vast areas subject to flooding discouraged settlement along the lower Hwang-Ho. Difficult gorges, rough country, and hostile aborigines blocked routes to the basins of the Yangtze east of Szechwan. Country too high and cold for agriculture lay to the west and dry territory to the north restricted farming to oasis sites. Southern hills were inhabited by hostile tribes of primitive Caucasoids. Chinese occupied new areas in large groups, by order of emperors, rather than as individual adventurers or pioneers.

By the start of the Han dynasty in 206 B.C., the Great Wall had attained a length of over a thousand miles but, as during all later time, it proved ineffective either in keeping hordes from the Dry World out of China or the Chinese from penetrating northward. More than two centuries were spent in fighting people identified as Huns, and who were certainly similar to some of the early Asiatic invaders of central Europe. After the repulse of the Huns, Wu-Ti (140-86 B.C.) added Kansu, Sinkiang, and northern Korea to China. Later came territorial decline and the division of China into three kingdoms: Shu in the west, Wu in the center and south, and Wei in the north. In A.D. 589 a period of peace and prosperity was initiated under the Sui emperors. A rise in the arts and other cultural attainments, coupled with political decline marked Tang dynasty times (618-907). More or less political unification came during the Sung rule which followed.

During these centuries of varying political fortunes there arose in China a distinctive culture, sufficiently different from that in other parts of Asia to warrant recognition of an individual culture

realm. "How can I face my ancestors?" became one of the strongest concerns of the individual. Cemeteries spread out over much fine land. Though all leading religions have come from the outside, the Chinese are inclined to blend them into general agreement with their own ancient philosophies of Confucianism and Taoism, which date from about the sixth century B.C. Mencius (372-289 B.C.) popularized the former and outlined an "ideal" political state. The exact wordings of the teachings of Confucius and Mencius became the central theme of Chinese education and requisite for governmental posts in a civil service system.

From India came Buddhism, the most widely adopted religion. Nestorian Christians appeared in westernmost China by the sixth century. Though they made many converts, they are remembered chiefly for having smuggled silk-worm eggs to Europe. This ended the Chinese secret and monopoly in producing silk. Mohammedanism arrived across the Dry World, reaching the northwest, where there are some 48 million Chinese Moslems today. In a minor way it also reached the southern and southeastern coasts. Jesuits brought Roman Catholicism, which has about 2.6 million followers today. Protestant converts number about 600,000.

The dominant languages belong to the Indo-Chinese family and include such Sinitic tongues as Mandarin, Amoy, Cantonese, Foochow, Ningpo, Shanghai, Swatow, and Wenchow. Northern Mandarin is widely spoken north of the Tsinling and Southern Mandarin to the south of that mountain range. Other languages and dialects vary so sharply that many Chinese have great difficulty in oral communication with persons living outside



Burial-ground landscape, China (American Geographical Society)

of their own districts. Curiously there is unification in the written language, an elaborate system of logograms, symbols that represent ideas. Our own numbers, such as "3," are logograms, which may be read as *three* in English, *drei* in German, or *trois* in French. Simple ideographs (more or less pictorial logograms) appear among hieroglyphics and in other forms of picture writing. Those in China are so elaborate and symbolic that it is difficult to detect their basic elements. Most logograms are conventional, rather than pictorial. Altogether some 80,000 have been devised, of which some 50,000 are still in use. Practically any Chinese knows a few; those dealing with family history and with his immediate trade or profession. It takes something like three years to perfect oneself in the operation of a typewriter capable of writing a fairly large number of logograms.

China is peculiar in having relatively few roads. Flagstone coolie trails commonly lead to stairways

cut in solid rock. The wheelbarrow and pientan (carrying pole, balanced on the shoulder and weighted with goods at either end) are in universal use. These devices are so inefficient that in some sections one third of the population are engaged as carriers, and 20 miles per day is normal travel speed. Chinese economy has not demanded a complex highway network. Such road systems as were built served for such purposes as facilitating army movements or collection of tribute.

Highly localized cultures and economic self-sufficiency as striking as that of old Russia are characteristic. Three quarters of all textiles are woven on hand looms. Agriculture is intensified, but primitive as to method. To produce an acre of wheat in northern China requires 26 man-days of labor, whereas in the United States it requires little more than one. House types vary widely, from dwellings carved in loess to boats, or, where Malay influences are strong, houses stand on piles. Thatch, mud, and stones are common building materials.



Chinese Realm:
languages

Society controlled by a system of ethics, rather than by law, is one of the strongest unifying culture traits. Coupled with it is an abhorrence of foreign innovations and fear of "loss of face." The belief is general that the best life is one in which the individual walks in the ways of his ancestors.

TSINLING

The Tsinling is a lofty range south of the Wei Valley, an eastern projection of the Kunlun, and terminal prong of the great east-west Eurasian mountain barrier. It divides China into its most distinctive parts. Passes lie at elevations of from 8,000 to 10,000 feet. The latitude is less than 35° N., or about equivalent to that of South Carolina, but snow clings to the summits until July and the isotherm of January 32° F. lies to the south of the mountain mass. Land to the north has an annual precipitation of less than 40 inches, that to the south more. Northward slopes are quite barren but those toward the south are heavily forested. Wheat and millet are the common cereal crops to the north, while rice is the main basis for life to the south. As a barrier, the several ranges of the Tsinling separate the lands of the Sere (Ch'in), on the north, from those of the Sin, to the south. More than a week of difficult travel on foot lies between the lowlands of the two. To the east, a similar cultural distinction follows the Hwai River.

Southern China is a land of rice, tea, mulberry trees, bamboo, tung, and tallow trees; where water buffalo are beasts of burden. The southern Chinese are a swarthy, frail and small-statured, mixed people, who are less purely Mongoloid than the northern Chinese. They are quick in mental reactions, subtle in action, and shrewd in business. Their landscapes are hilly and green. Agriculture is favored by growing seasons that last for at least three quarters of the year.

Northern China is a land of wheat, millet, soybeans, grass, oxen, and camels. The northern Chinese are taller, lighter complexioned, and more robust people, of purer Mongoloid ancestry. To the southerners they appear lacking in grace and tact. Mandarin (Kuan-hua) is rather commonly understood and spoken. Landscapes include extensive flats that remain brown much of the time because growing seasons last for less than half of the year. Skies are at times darkened by drifting dust. Famines are endemic, being caused by floods, locusts, and occasionally by storms. Between 108 B.C. and A.D. 1911, famines appeared almost yearly.

The Tsinling has been far more effective than the Great Wall in sheltering China from Dry

World invaders. People to the north not only came into contact with foreigners seeking control of parts of China but also became active aggressors or traders at times.

While the Great Wall was started during the third century B.C., most of its construction actually dates from the late fourteenth century. It became nearly 2,000 miles long and had a width of 20 or more feet and height of from 20 to 40 feet at most places, with numerous watch towers to command view of approaching enemies. Parts of the barrier were carved in loess or other materials at hand and others were constructed of masonry. Hun, Mongol, Manchu, and other invaders found



Flagstone coolie trail (American Geographical Society)

little trouble in crossing the wall. Buddhism and Mohammedanism breached the rampart readily. Cultural penetrations found more serious obstacles in Chinese conservatism, prejudices, and population density. On the whole, invaders were culturally inferior to the Chinese and therefore were held in such contempt that they were regarded as "devils."

From their Wei Valley culture hearth the northern Chinese spread to Kansu (dry place), west of the great bend of the Hwang-Ho. Lands suited to agriculture, whether dry farmed or irrigated, were occupied. Lanchow became a thriving commercial center, exchanging silk, porcelain, and other Chinese products for jade, furs, and other things. To Kansu came Mohammedanism and today about one quarter of the Moslem Chinese live there.

In A.D. 1211 Genghis Khan began helping the northern Chinese subdue a troublesome people, the Chins. Aid turned to political control, so that before long Shensi, Shansi, Honan, and Hopeh were added to the empire of the Khan. Kublai Khan was one of the few conquerors who managed to cross the Tsinling, extending his domain past Szechwan to Yunnan and Burma. This Mongol (Yuan) dynasty ruled from 1260 to 1368, eventually being broken up by a rebellion that originated in Nanking in 1356. In 1275 Marco Polo became the only European Mandarin and in 1293 John of Monte Corvino established the Roman Church in Peking, where he taught 150

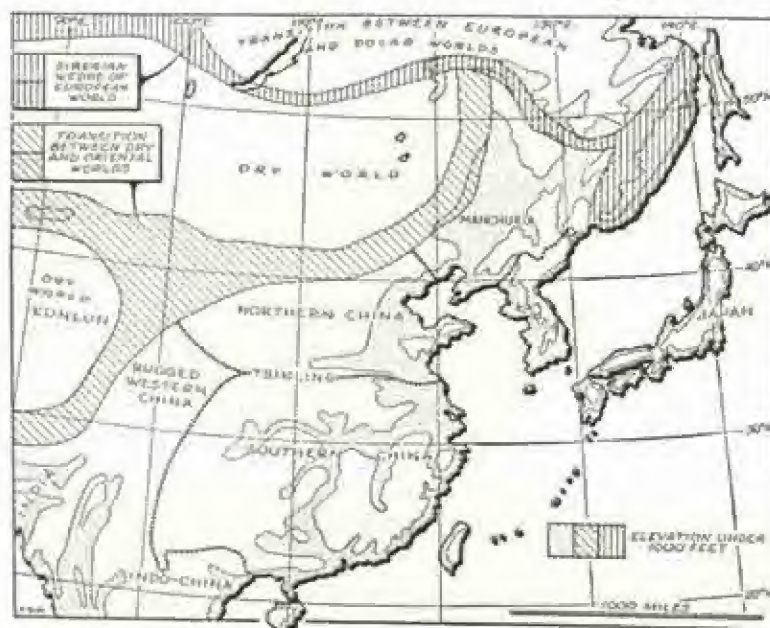
Chinese boys to read Greek and Latin. Trade with the West was at its zenith in Mongol times and guides for travel in China were being issued in Europe.

SZECHWAN

The first important migration of Chinese across the Tsinling led to the upper Yangtze basin of Szechwan (four streams). Here was an attractive green hilly region larger than any European country west of the Soviet Union; some 75,000 square miles in Red Basin and about twice that in the province as constituted today. Yangtze lowlands have an elevation of about 1,000 feet and surrounding hills rise to from 3,000 to 4,000 feet. The Tsinling keeps out invasions of icy, central-Asian air. January temperatures on the lowlands average about 50° F., and July, 80°. Growing seasons are long, only about forty days being subject to killing frost, and soils are good. The adequate precipitation provided a forest cover originally. Bamboo and such trees as pines, cypress, banyans, namu (a broad-leaved evergreen with valuable wood), and lowland palms were cleared away as more need was felt for agricultural land. Here the Chinese found comparative peace and experienced prosperity.

An old Shu kingdom was overthrown by Ch'in in 316 B.C. Li H devised a method of irrigation that has operated successfully for over 20 centuries on the fertile Min flood plain, in the vicinity of Chengtu. Population grew rapidly. A severe tragedy occurred in the thirteenth century, when

Kublai Khan's forces killed over a million Chinese. Another occurred in the seventeenth century, when a Shansi war lord ravaged Red Basin, wiping out a majority of its inhabitants. During Manchu times many political exiles were banished to Szechwan, a place considered as the "end of the earth." The majority of its inhabitants, however, are descended from immigrants from Hupeh and Kiangsi provinces.



Eastern Asia: cultural divisions

Szechwan now has about 60 million inhabitants. Every acre of potential agricultural land is in use, slopes with gradients as steep as 45° being terraced. Rice provides about half of the food, being followed by maize as a second cereal crop. Wheat, sweet potatoes, beans, peanuts, and other food crops supplement diets. Rape, sugar cane, tea, tobacco, citrus and other fruits, opium poppies, and mulberries are other important crops. Upland pastures provide wool. A little cotton, some silk, and considerable hemp supply fiber needs. The poorer hill soils grow tung trees, the oil-rich nuts of which give China one of its leading exports, a powerful drying oil for varnishes. Limited amounts of coal, iron, copper, gold, and salt are the principal mineral resources. Upstream forests provide pine, fir, spruce, and various hardwoods. Few regions have so many varied and useful resources.

On the best land the rural population density commonly reaches 4,000 per square mile. Five or six crops may be raised each year, cesspool manure being used as fertilizer. Landscape greenness rivals that of western Ireland. Nearly 40 per cent of the annual precipitation occurs in summer. Winter, the dry season, has about 13 per cent.

Chengtu (440,000), the traditional political and agricultural stronghold, occupies a protected site well north of the Yangtze. *Chungking* (986,000), on the site of ancient Paksien which had a city wall dating from 320 B.C., lies to the east. Beyond the narrow lanes of the inner city are modern streets constructed during the last few decades. Automobile highways lead to Kansu, Shensi, and Kweichow. As a Yangtze port, the main interests were commercial until 1938, when the city became World War II capital of China. With cessation of hostilities the capital was returned to Nanking, along with many educational and other institutions that had found temporary refuge in Red Basin.

UPPER YANGTZE

Above Szechwan, the watershed of numerous Yangtze tributaries is rugged country extending across the Ching-Cheng and various other magnificent ranges to the Great Snowy Mountains, or Chinese Himalaya. Agricultural terraces rise to elevations of 8,000 feet, where rice gives way to wheat and other cereals. Some barley is harvested above 12,000 feet and the snow line lies at about 17,000. Wool is produced on higher pastures, which extend up into alpine tundra. Below the timber line is taiga-like forest, with spruce, fir, birch, willows, and various poplars.

Tatseinlu, at an elevation of 8,400 feet, is gate-

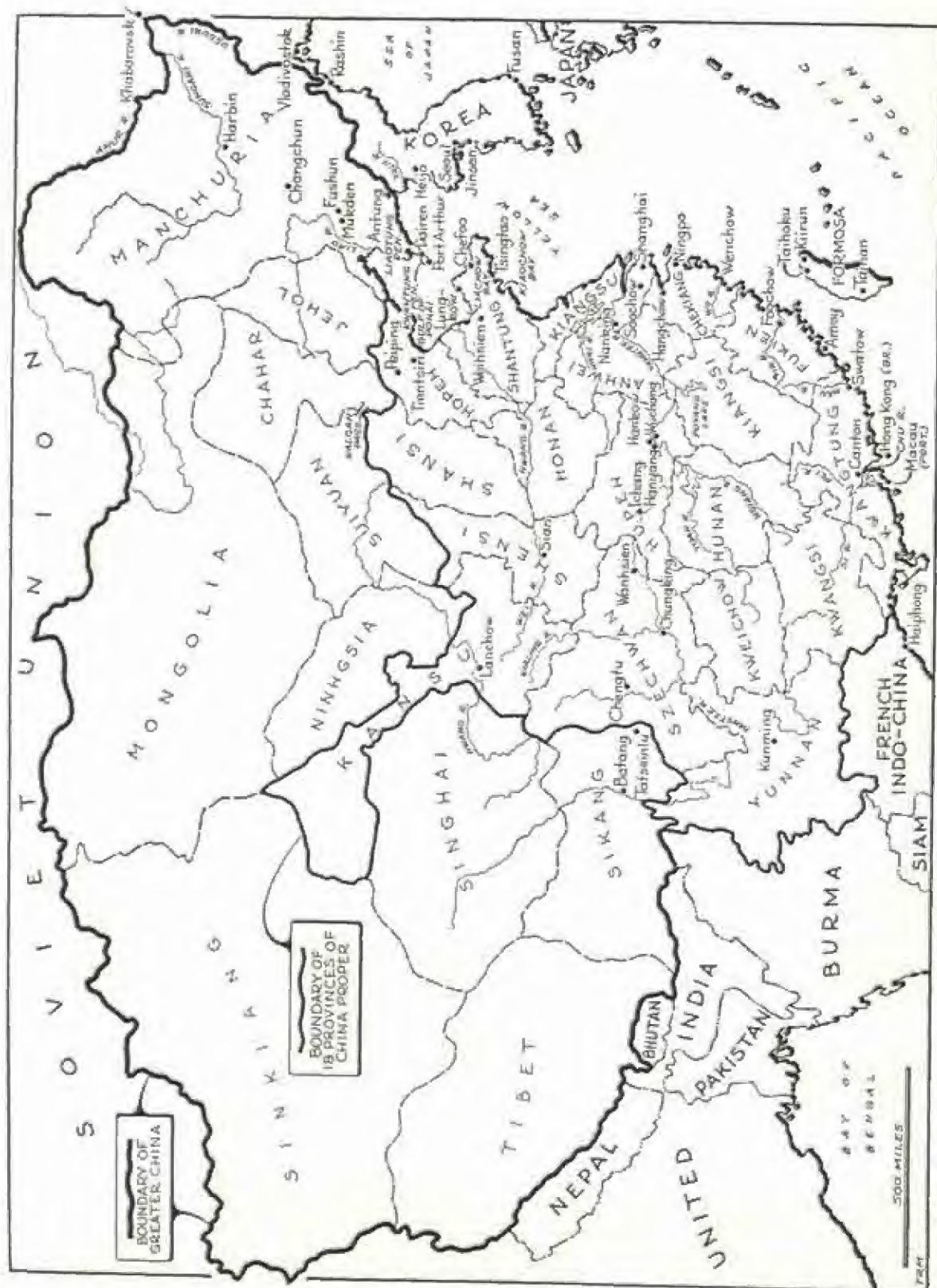
way to Tibet; the place where goods leave the backs of coolies or are transferred from wheelbarrows to the backs of mules and yaks. Brick tea and other Chinese products are exchanged for musk, yak tails, furs, salt, rhubarb, and various minerals. Trails westward are indeed rugged. At Batang (Pa-an) the Yangtze is crossed by a bridge 1,200 feet above the river, over a gorge so narrow that stream stages vary more than 100 feet between flood and low water. To the west are the deep valleys of all the major rivers leading to Indo-China, Burma, and Assam, separated by lofty and inaccessible divides. The most important commercial trail leads to Lhasa, but branches turn southward to Burma. World War II witnessed the construction of roads south of these trails, through Yunnan and Kweichow, to Chungking.

YANGTZE GORGES

The Yangtze enters a formidable gorge region east of Szechwan. Territory is so rugged that the Chinese were prevented from spreading eastward for many centuries. Between Wansien and Ichang the river drops 300 feet in a distance of 200 miles; a gradient sufficient to impart velocities of nearly twenty miles per hour during summer flood stages. Confining walls are only 600 feet apart at one place. The stage variation amounts to about 200 feet. At low stage the channel is filled with dangerous shoals and rapids. Navigation is carried on from nine to eleven months of the year, when waters are sufficiently deep across the shoals. Forty-ton junks are warped upstream by 100-man gangs, who require three months for the 400 mile trip from Ichang to Chungking. About 10 per cent of the junks are wrecked or fall prey to brigands along the way. Steamers of sizes ranging up to 1,400 tons ply the gorges in summer but their powerful engines require so much space that little area is left for cargo; few can run at a profit.

MIDDLE YANGTZE LOWLANDS

When Chinese culture started developing in the Wei Valley, the lower basins of the Yangtze were occupied by Annamese and other peoples familiar in existing populations of southern China, Indo-China, and Siam. Kingdoms of Yueh and Wu survived until about the fourth century B.C. Tais and Chus were in possession of the finest lands until about the first century B.C. Chinese may have sought the excellent porcelain clay of



Greater China: Index map

Kaolin (high hill; now the name of a typical clay mineral), east of Lake Poyang, as early as the eighth century B.C. By the third century of that era many Chinese were settling Han Basin lowlands.

Ichang, at the western end of Han Basin, is one of China's most central locations. Within a radius of 600 miles are practically all of the large cities and 500 miles away is the entire arcuate coast from Shanghai to west of Hong Kong. Eleven hundred miles up the Yangtze and at an elevation of 200 feet, it is a port open to foreign trade, where ships drawing 12 feet may land at all seasons.

Extensive lakes tend to cut down flood heights in the Middle Yangtze lowlands, but the flood of 1931 rose more than 50 feet at Hankow and spread over an area of 42,000 square miles, causing over a million deaths. Most of the lakes lie in lowlands between the natural levees of alluviating streams. Population is concentrated along these levee strips and on lands drained by an elaborate system of canals.

Marginal to the lowlands are areas notable for mineral resources. Over half of the world's tungsten ore (wolfram) is normally produced there and considerable quantities of iron, antimony (valuable because unlike other metals it shrinks on heating and therefore is useful in producing alloys that maintain constant volume when subjected to change in temperature), and excellent coal. Kiangsi province, to the south, is particularly rich in minerals, though the antimony comes mainly from southern Hunan.

The drainage basins of the Yuan and Hsiang rivers are extensively forested. Bamboo, pine, cypress, camphor, and other forest resources are rafted to Hankow and other cities.

Hankow (778,000), with its satellite cities of Wuchang (400,000) and Hanyang, is the main cross roads and port of Han Basin. Ships of 10,000 ton weight reach it in summer and many of about half that size during the low-water stages in winter. Manufacturing includes heavy industries, wood and forest products mills, food processing, and other activities. Vegetable oils and brick tea are important export items. Hankow is the commercial center of the conurbation. Wuchang is politically important as provincial capital of Hupeh. Hanyang is industrial.

The Anking narrows, outlet of Han Basin, are subject to disastrous floods. Rice is the main crop of the lowlands, while maize and sweet potatoes are grown on hills. Oil-seed crops and various vegetable waxes are upland products. One of the specialties is Chinese ink (commonly called India ink), a combination of the soot of extremely

fine-grained, resinous wood and a vegetable-oil base.

YANGTZE DELTA

Few Chinese penetrated the deltaic lowlands east of Anking narrows until about ten centuries ago. The delta is culturally young in comparison with Szechwan, or the Middle Yangtze lowlands. Shanghai was little more than a small fishing village in the eleventh century and did not attain the dignity of having a wall until the fourteenth. Japanese pirates destroyed it in the sixteenth century and by the beginning of the nineteenth century it had become only a rather minor port for junks. As an important city it dates from 1843. Even Nanking is comparatively young, though it was nucleus for overthrowing Mongol rule and a fourteenth century capital with walls 50 feet high. It took considerable population pressure in basins to the west to force the Chinese to reclaim their delta lands on a large scale.

The Yangtze delta is the southern end of a plain some 700 miles long. Lowland reaches in from the coast for as much as 100 miles in the south, and considerably more in the Hwang-Ho delta. This recent alluvial plain is the compound delta of many rivers, chief among which are two dominant streams of northern and central China. From the cultural standpoint the Yangtze delta region extends north to the Hwai River, not quite as far north as the provincial boundary of Kiangsu, in the narrows of the plain between the hills of Honan and Shantung.

The deltaic part of Kiangsu province is an Oriental World equivalent of the Netherlands, with extensive polders and a dense canal network. Agricultural productivity is immense. There is abundant summer rainfall and January temperatures average above 32° F. Two crops of rice are grown during the warm season and a green crop in winter, the latter being plowed under to enrich the soil and give it a more desirable texture. Most of the rice fields are flooded about half of the time. Mulberries and willows line canal banks. Most transportation is by boat or barge. About 70 per cent of the area is cultivated and many a square mile of rural territory has over 9,000 inhabitants. About 15 per cent is included in lakes. Only about one tenth of the surface remains as undrained flat.

On drier lands and the hills to the west is grown about one third of China's cotton. Shanghai and other cities of Kiangsu rank foremost in textile manufacturing.

Shanghai (6 million), largest city on the Asiatic mainland, recently has been adding half a million population per year. Its modern business district is European, with skyscrapers rising over 20 stories. Relatively soft and saturated alluvium provides a poor foundation for such buildings, requiring that they be anchored to deep pilings, as in New Orleans. Though near the mouth of the Yangtze it is not on that river but on the Whangpu, some fifteen miles inland. An excellent port is served by a 31-foot channel. Nearly half of China's industry lies in Shanghai. The city handles over half of the country's foreign trade, two thirds of its silk export, and over two thirds of its tea. Cotton goods manufacturing is the foremost industry, but factories produce flour, soap, chemicals, cement, paper, tobacco products, and various other commodities.

Most of Shanghai's population is Chinese. Prior to World War II the foreign population was only 75,000, in spite of the fact that large areas are designated as "International" and "French" settlements. Beyond the urban nucleus of the European city stretches a vast, squalid native settlement of houses and shops one-story high.

One tenth of the world's population lives in the

hinterland of Shanghai. The commercial significance of this huge population is comparatively small. Living standards are extremely low. With great self-sufficiency in maintaining themselves on a subsistence basis, the Chinese demand relatively little from the outside world and contribute comparatively little to the world's commerce. The commercial potential of Shanghai would rise enormously if living standards were raised appreciably.

Nanking (1.1 million), the "South Capital," was the leading political center during most of the Ming dynasty (1368-1644). The succeeding Manchu (Ch'ing) dynasty established its capital at Peking, the "North Capital," in 1644, where it remained until after the fall of that dynasty in 1911. Under the Republic, Nanking again became capital in 1928. The city has tremendous political prestige because it has served as capital during times that the Chinese have been free of foreign rule. It is an important educational center and seat of the National Central University. *Soochow* (260,000), about sixty miles west of Shanghai, noted for its beauty, and *Hangchow* (507,000), near the mouth of the Tsientang and extreme southwestern corner of the Yangtze delta region, are other great cities of the plain. The latter is an important silk manufacturing center and provincial capital of Chekiang.



Chinese woman spinning cotton (U.S.D.A. photograph)

South of the Yangtze basins is an upland region where less than 15 per cent of the land is flat, precipitation is heavy, and winters are mild. Icy blasts of central-Asiatic air that at times drop temperatures at Shanghai as low as 12° F. are unable to penetrate the hills of southern China except as highly modified and comparatively warm air streams. Forests are widespread; broad-leaved evergreens merge upslope with conifers. One type of bamboo grows more than 100 feet tall, with stems over a foot in diameter. It is useful for structural timber, masts, furniture, paper making, and other purposes.

In places the Chinese actually practice forestry. Pines, fir, and bamboo are planted as crops. Tea has been raised for more than twelve centuries; its importance is declining. Oranges, tangerines, lemons, mulberries, and camphor trees flank lowlands, where rice is the crop of almost all flatter land. Cotton, wheat, peanuts, rape, tobacco, sweet potatoes, and sugar cane are raised above the paddy fields. Barley is the cereal crop of uplands.

The lowlands are densely populated by Chinese, who raise three rice crops each year in some parts of the extreme south. Uplands are rather sparsely occupied by hill tribes, such as the Lolos and Miaos of the west, who are comparatively Caucasoid, and Hakkas in the east. The non-Chinese are politically independent of central or provincial authority in most regards, remaining organized under local tribal leaders.

Yunnan, in the extreme southwest, is chiefly a limestone plateau. Solution (karst) topography is widely developed, both here and eastward. Peculiar steep-sided hills, *hums*, rise where rock has locally resisted dissolving. Caverns are numerous and much drainage is along underground channels. Over a third of the people live in small basins that have sunk below general levels because supporting limestone has been dissolved from below. These are floored by good soil. A great many people are afflicted with goiters, a malady common in limestone regions.

Yunnan has been remote and inaccessible to China. The railroad from its capital, *Kunming* (200,000), leads southeastward to Haiphong, in French Indo-China. Coolie trails and World War II roads lead to Burma and China. From the former came the beast of burden, the carabao or water buffalo, and sugar cane. From the latter came the ancestors of about half of the population. Fully half of the 10 million people in Yunnan's 150,000 square miles are non-Chinese. The Chinese are comparatively late arrivals and many speak Mandarin.

The non-Chinese eat maize, millet, and barley. Lolos, the most primitive and Caucasoid, inhabit rougher parts of the northwest and depend rather heavily on hunting. They supply furs for trade. The Mai, Yee (Tan), and others who resemble the Siamese in being more Mongoloid, raise cinnamon, anise, mace, and other spices. Many of them work with the Chinese in mines.

Mineral wealth is considerable, but coal supplies are insufficient to provide a good basis for industrialism. About 7 per cent of the world's tin comes from southern Yunnan. Other ores mined and exported include copper, antimony, iron, mercury (quicksilver), and gold. The copper deposits are the richest in China. Sulphur occurs in scattered localities in western Yunnan.

Most export is through Haiphong. In addition to mineral products are hides, furs, opium, spices, and bristles from white pigs (for tooth brushes). A famous green tea, "Pol," finds an eager market in China.

Coastal Kwangsi and Kwantung provinces are semi-tropical. January temperatures average about 50° F. in the uplands and 65° at a few lowland points along the South China Sea. Oranges, bananas, lichees, figs, sugar cane, pineapples, melons, ginger, and various fruits are important crops. These indicate infrequency of frosts and rarity of snow.

Practically every square foot of available flat land is given to rice. Population densities in rural areas range on up to 3,000 per square mile near Canton. These overcrowded lands have long been the main source of Chinese coolies, who have emigrated widely in hope of making an adequate living elsewhere. Canton dialect has thus become the Chinese language most widely spoken outside of China and Cantonese food the cuisine most commonly identified as being purely Chinese by Europeans.

Fish farming is important in providing food in Kwantung. Curiously it is coupled with silk production. Mulberry trees around ponds provide food for silkworms and the refuse from cocoons serves as food for the fish. Poultry raising, with an emphasis on ducks and geese, is also highly developed.

Canton (Kwangchow: 1 million) is less than a thousand years old as a Chinese settlement. Located on the Chu Kiang (Pearl River), well up the compound river-delta of the Si Kiang, Pei Kiang, and some smaller streams, its site is strategic and one undoubtedly used by sea-going Malays and others before the Chinese arrived. Arabs are said to have traded there in the fourth

century. The Chinese city grew as a congested settlement along narrow lanes, from which wheeled vehicles are barred and along which the affluent are carried in sedan chairs. Wider streets were added in recent years in a zone surrounding the old city core. Since 1936 a railroad has led northward along the Pei and down the Lui valleys to Hankow and Peiping. This great central line follows an almost meridional course across China.

Tea from the hills and silk from the delta furnish Canton's main exports. Ships of medium draft are able to enter the harbor. The Si Kiang, to the west, is navigable for boats drawing six feet, as far as Wuchow, about 200 miles distant. The Portuguese traded with Canton in 1516 and by the middle of the century were bringing considerable silk to Europe. In 1557 they acquired possession of Macau (Macao), an island at the base of the delta. This rival of Canton is now decadent and of little consequence. It is noteworthy mainly as being the first European possession in China.

Hong Kong, a name generally applied to the city of Victoria on the island of Hong Kong, has the best harbor in China and at times has attained the rank of the third busiest port in the world. It lies almost midway and practically on a direct route between Singapore and Kobe, and has typical "south tip" strategic importance; facts recognized by the British, who occupied it in 1842. Excessive precipitation and granite hills that rise to 1,800 feet furnish an excellent water supply which has had much to do with a splendid health record, which has been maintained in spite of extreme population density. Within the city are about 80,000 people per square mile; a congestion equivalent to Manhattan Island. The entire territory has an area of almost 400 square miles and has a population of 1.80 million. The island itself covers but 32 square miles. Across a narrow channel is the city of Kowloon, terminus of a railroad from Canton. The population is overwhelmingly Chinese, there being fewer than 25,000 non-Chinese in the entire territory. During World War II some 750,000 Chinese refugees arrived.

Hong Kong is a British creation and is administered as a Crown Colony. The naval base has considerable importance, but the greatest value of the port is commercial, as an entrepôt and exporter of tin, hemp, silk, tea, and other Chinese products. Industrial development has resulted in tin smelters, cement plants, and tobacco and food processing establishments. One of the interesting specialties is cloth made from pineapple fiber.

SOUTHEASTERN CHINA

Southeastern China is a hilly region served by a long coast with excellent harbors, each of which has only a limited hinterland. About 5 per cent of the land is flat and less than 20 is under cultivation. Monsoonal conditions are well developed, the greater part of an annual precipitation of up to eighty inches falling during the warm season between May and September. Typhoons strike the immediate coast with the same fury exhibited by their American relatives, the hurricanes of the West Indies, or Gulf storms that occasionally damage places from Texas to Florida.

The first Chinese arrived in T'ang dynasty times, not much over a thousand years ago. They found semi-Caucasoid peoples scattered among the hills and Malays along the coast. The Yao and other semi-Chinese still inhabit a good deal of the interior. From the Malays the Chinese acquired many culture traits that set the southeasterners apart from people elsewhere. The Chinese along the coast between Canton and eastern Chekiang province take to the sea as readily as Malays. They have evolved various types of sailing craft, some of which are speedy enough to permit a high proficiency in piracy. Other craft have become the main commercial carriers of the eastern East Indies and islands extending north to the Philippines. It is here that the Chinese depend most heavily upon the sea as a source of food and other resources. Like Malays they show a decided preference for living along streams, in houseboats or in dwellings elevated on piles. The coastal dwellers also had the Malayan experience of trading with the Arabs between the eighth and fifteenth centuries. Amoy, Swatow, and other ports became important Arabian outposts.

The ancient rocks of the hills of southeastern China furnish excellent building stone, much in demand in the cities of Kiangsu and elsewhere. They also provide soft materials, such as soapstone, which are readily carved into ornamental objects. The ruggedness of the coast is an expression of the resistance of old rocks to erosion. The Han, Min, Wu, and other rivers lack sufficient sediment to build large deltas, so most river mouths are estuarine. Important, though as yet undeveloped, hydroelectric potentials lie in the hills, where they are associated with valuable metal ores. In the future the region will become important industrially.

Cities such as *Amoy* (234,000), *Foochow* (390,000), and *Wenchow* (631,000) are restricted to the coast and are primarily commercial. Foochow is only about 100 miles from Formosa and serves as the main base for trade

with that island. Silk, straw hats, rattan objects, timber, tea, salt, stones, carvings, paintings, and products of the sea are leading exports. The little cuttle fish stuck between the wires of a canary's cage is the internal skeleton of a relative of the octopus that likely was caught along the coast of southeastern China. Rice is the main cereal food and is raised on almost all lowland flats. Sweet

potatoes, beans, excellent oranges (which are native to this region), and many other crops are grown along the valleys and lower hills. A warm, wet climate also favors growing of sugar cane. Forests cover more remote places, where the inhabitants are less purely Chinese.

44: Northern China, Manchuria, Korea, Formosa

All of northern China lies on the cold side of the isotherm of January 32° F. People must protect themselves from extremely low temperatures by dressing warmly and constructing substantial dwellings. Much of the region lies beyond the limits of rice cultivation, so that millets of various sorts, barley, and wheat are staple crops. Rivers are frozen in winter, permitting use as cart roads where the ice is covered with millet stalks. Trees are rare in comparison with central or southern China. Though various mixtures occur, the population is more purely Mongoloid.

DELTA PLAIN

The Hwang-Ho, though over 2,500 miles long, is in many ways an unsatisfactory river to man. In winter it shrinks to a rapidly flowing but shoal stream with a discharge as low as 10,000 cubic feet per second. In summer it swells to an unruly, turbulent torrent that may spread widely and bring terrific disasters to lowlands in its delta. In 1923 the discharge was over 350,000 cfs, or about thirty-five times the minimum, low-stage flow. No season finds the channel useful for navigation by boats of commercial size. Below Lanchow the river erodes vast quantities of silt, acquiring a load that is flushed downstream with vigor because the gradient is on the order of six feet per mile. The channel shifts widely in the great bend region, beyond the Great Wall. Even in the delta the gradient is about one foot per mile, insuring summer flow at velocities that not only subject the river to affluvation and channel shifting but also cause disastrous flooding when breaks occur in the artificial levees along its sides. Between 1192 and 1852 the Hwang discharged into the Yellow Sea to the south of Shantung Peninsula. A major diversion, nearly 250 miles from the coast, resulted in a channel leading to the Gulf of Pohai (Chihli) to the north of Shantung. In 1938 it returned to the earlier course, but during the summer of 1947 was artificially diverted toward the Gulf of Pohai.

Inhabitants of the Wei Valley and other relatively secure places were slow to settle in the delta, where it was necessary to cope with such

a river. Only gradually did they adapt themselves to the lower Hwang flood plain, where they embarked on heroic measures to tame the stream but where floods have claimed the lives of several millions.

Rice is the main crop toward the south. Millets (especially kaoliang), wheat, beans, soybeans, peas, and other crops are increasingly important northward, with barley on uplands. Low mulberry trees line the banks of canals; silkworm rearing is a secondary occupation of many small farmers. Population density is on the order of 1,000 per square mile in more settled areas. Transportation turns to ox-carts or to rafts and boats on canals.

The Grand Canal, which connects the Yangtze near Nanking with Peiping, was dug across the delta plain for the purpose of bringing tribute, mainly in the form of rice, to the northern capital. Some southern parts of the canal are well over ten centuries old, but the northern part was constructed during the thirteenth century by the Khans. Though in active use during much of Manchu dynasty time, long reaches have now silted, especially in the north.

SHANTUNG

Shantung lies between the northern and southern parts of the Hwang-Ho delta. As a peninsula it juts toward the Liaotung (and Kwantung) Peninsula of Manchuria; the two form a barrier that almost severs the Gulf of Pohai from the Yellow Sea (Hwang Hai).

Across the highlands of Shantung runs the low Laichow-Kiaochow gap which is followed by a railroad leading from Tientsin to the all-year port of Tsingtao. Tai Shan rises to about 4,500 feet toward the western end of the mountains of western Shantung. The uplands to the east are more rugged, with considerable summit area above 4,000 feet.

Shantung was occupied by the Chinese long before there was any extensive settlement in the delta plains. Confucius (Kung-Fu-Tse) was born there in about 551 a.c. Ancient deforestation has left the uplands rather barren. With the exception of some saline flats, the bordering lowlands are

fertile and not subject to flooding. Ordinary food crops are the main agricultural products but the raising of castor beans (castor oil) and wax trees assumes considerable importance. Silkworms are reared on both mulberry and oak leaves. Pongee, an unbleached silk, is a manufacturing specialty and together with low-grade silk from Manchuria is an export of considerable value. The real wealth of Shantung, however, lies in rich iron ores and excellent coal.

The Japanese have long been envious of the industrial potentialities of the province. An occupation in 1895 ended under pressure of European nations. *Tsingtao* (524,000), key to the mineral wealth, was acquired by the Germans who constructed modern docks and spent a great deal of money developing the city, only to lose it in World War I. Together with Chefoo it carries on an active winter trade when Tientsin is normally ice-bound. Weih sien is an important coal center which some day should become an industrial giant.

HOPEH PLAIN

Most of Hopeh province is a higher, flat, unflooded continuation of the northeastern lowlands. Winter cold is intense, forcing inhabitants to wear heavy, quilted coats. Spring brings dust storms from the Ordos and loess-covered territory toward the great bend of the Hwang-Ho. Summer is a season of moderate rainfall and temperatures high enough to mature wheat and cotton. Horses and mules are relatively numerous. Population density is high according to Western standards, but farms are large for China, the average having about five acres of land requiring the labor of five or six hands. In Kiangsu the average is 1.5 acres and is worked by seven people. In the United States the average farm occupies about a quarter of a section, nearly 160 acres, and is likely to employ no more people than a farm in China.

Tientsin (1.3 million), leading city of the Hopeh Plain, is the busiest port in northern China and ranks after Hong Kong and Shanghai. It has one of the very few harbors of northeastern China, a region which for the most part presents only low, deltaic plains along its sea front. Under natural conditions Tientsin was closed from January to March but ice-breakers now keep the channel open, almost without interruption. Exports include wool, raw cotton, furs, rugs, skins, bristles, eggs, and walnuts. Industries consist of flour mills, salt works, and factories that turn out rugs, carpets, cotton cloth, artificial silk, and other products. The city is the commercial capital of an agricultural region that produces a large share of China's wheat and nearly as much cotton as the hills

west of Shanghai. In 1901 its old city wall was torn down and the area it occupied converted into an attractive park.

THE INTERIOR

Though Peiping lies not far from Tientsin, on the borders of the Chihli Plain, its significant ties are with the interior. As Yen ching it was founded in 920 by non-Chinese people. The city plan dates from the thirteenth century, when it became a march-site capital of Kublai Khan. High brick walls form a parallelogram which encloses wide streets, such as nomads from central Asia were likely to lay out in planning a city. The Tatar inner city covered an area of four by five-and-one-half miles. Foreigners were denied entry to the seat of government, a "forbidden" city, which was opened only in 1901. Peking (North Capital) was the early seat of the Ming dynasty after the fall of the Khans and before transfer of the government to Nanking. More recently it has become capital of Communist China.

Peiping (North Peace; 1.6 million) lies close to Kalgan Pass, gateway to Mongolia. Though a railroad extends almost to the Great Wall, camels come down to the city for loads of silk, brick tea, and other goods to be carried by caravan as far as Uzbek or the Kirghiz S.S.R. The animals return with loads of fur, hair, wool, hides, or rugs. Local coal supplies, coupled with iron ore, account for considerable industrialization. Smelting dates from the early twelfth century, before the Khans had started their march toward empire. The Pei-Ho leads to Tientsin and the Gulf of Pohai, but its commercial use is handicapped by ice that lasts for two months or more.

Shensi and Shansi provinces furnish about four fifths of China's coal, with reserves sufficient for many centuries. *Sian* (450,000), in the Wei Valley culture hearth, was the largest city in China from 1122 B.C. until A.D. 1127. It served many times as capital. During the Han dynasty (206 B.C.-A.D. 220) it was one of the world's greatest political centers, for a time exercising authority over lands as remote as the borders of Lake Balkhash. In the sixth century it was capital of a much smaller China. During the Golden Age of Chinese literature (Sung dynasty, 960-1126) it stood foremost in education. Sian was the eastern terminus of the Imperial Road to Lhasa and the Old Silk Road to Samarkand, or to India. To it went the first Nestorian monk who reached China proper, in 781. Though the population is small in comparison with several other Chinese

cities, Sian is still an important place. Automobile roads now lead to Szechwan, Lanchow, Turim, Turfan, and the Dzungarian Gate to the Soviet Union. It is the leading commercial town in a district producing large amounts of wheat, barley, millet, and cotton. An old opium trade has practically disappeared, but there is still fairly heavy silk production. Industrialism lags far behind Shensi's potentialities.

Kansu shades off into the Dry World. Winters are so cold that even the Hwang-Ho is frozen for about six weeks at Lanchow, in a latitude similar to southern Virginia. Wheat, millet, a variety of vegetables, melons, apricots, tobacco, and various other crops are grown by irrigation or dry farming. Extensive oil-shale deposits are starting to yield petroleum. Though timber is available in the mountains and other building materials could be utilized, the people of the loess hills of northern Kansu prefer to dig their dwellings into hill-sides. These homes are cool during the hot summer, require little heating in winter, and are easy to construct. At times they are dangerous. So many collapsed during an earthquake in 1920 that nearly a quarter of a million persons lost their lives.

The Moslem stronghold of *Lanchow* (500,000), 1,600 miles up the Hwang-Ho, boasts a steel bridge across the river and lies on the main road west from Sian. Its commerce consists chiefly of exchanging various Dry World products for those of China.

URBANIZATION

The traditional Chinese city has always functioned primarily as a commercial center, with more or less political significance. Prior to 1842 most large cities were located in the interior, each serving the needs of its particular province or trade area. Most foreign commerce was directed westward, so that Sian, Lanchow, Chengtu, and similar places on trails leading into Asia were the main trade centers. In 1842 the British gained rights to use the ports of Canton, Hong Kong, Amoy, Foochow, Ningpo, and Shanghai. A new, over-seas commerce soon followed. Sea-borne trade had been carried on for many centuries in a small way, by Arabs, Chinese, Portuguese, Dutch, and others, but the impact of the Commercial Revolution came only after British merchantmen and American clippers began arriving in large numbers, offering high prices for impressive quantities of tea, silk, opium, and other products. Seaports, rather than the age-old interior

cities, became the main commercial outlets. All of the five cities in the million class, Shanghai, Peiping, Tientsin, Nanking, and Hong Kong, have attained their huge populations recently and as a result of over-seas trade. Hankow, a river port, would be on the list were it not for the fact that its conurbation is politically divided into several parts.

Chinese cities are still primarily commercial. The smelters of Peiping, textile factories of Shanghai, and various industries of Hankow represent a vigorous start in the direction of an Industrial Revolution, but the per-capita use of iron in China is still only about three pounds annually, as compared with half a ton in the United States.

Communications are so poorly developed that no city is very important as a route center. The highways of recent years are few in number and bear little resemblance to the high-speed roads of Europe or the United States. The rail net consists of very few lines. Canton is a modest rail hub in southern China and Peiping a more significant center in the north. The line between the two was completed so shortly before World War II that its commercial possibilities have never been tested. A few lines run across the plains of northeastern China, but elsewhere railroads are almost nonexistent.

MANCHURIA

Manchuria and Jehol province of China cover more than half a million square miles, an area equivalent to Texas, New Mexico, Oklahoma, and Arkansas. Of a population of 43 million (about two fifths that of the United States) all but 4 million are Chinese. The Chinese have been filtering into Manchuria for several centuries. In some years as many as a million arrived, ordinarily on foot, with family possessions being pushed along on wheelbarrows. Within recent years the emigration has declined to about one quarter of a million. With about one quarter of China's area, Manchuria has only about one eighth as many people. It has been a place where the Chinese might escape floods, famines, bandits, and corrupt governments. Many have gone as coolie workers. Some emigration is seasonal, harvest hands being sent from Tsingtao, Lungkow, and Chefoo, Shantung. That Manchuria is still a pioneer country, with many opportunities, is indicated by a ratio of three men for every two women in its population.

The native Manchurian is descended from Tungus-like people who resembled the ancestors of many American Indians. Racially Mongoloid, he speaks an Ural-Altaic language. Today he is an inconspicuous element in the population of his

native land. The Chinese have taken most of it. Various Mongoloids from the Dry World have encroached on lands of western Manchuria.

Russians reached the Amur Valley in 1644. Most of them were Cossacks who were skilled in fighting, exploring, and trapping, but knew little about raising food crops. A brisk fur trade attracted a considerable population needing a food supply that was furnished by an increasing number of Chinese, who readily adapted themselves to farming in northern Manchuria.

A branch of the Trans-Siberian Railroad across Manchuria saves 600 miles of distance to Vladivostok over the line that runs down the Amur Valley through Soviet territory. Harbin, a nodal point on this Manchurian line, became a Russian stronghold, where there are now some 100,000 persons of Russian descent. Vladivostok, however, was ice-bound for as many as three months of the year. To overcome this disadvantage the Russians developed an alternate port, Port Arthur (Lushan), in southern Manchuria, on Kwantung Peninsula, the extreme tip of Liaotung Peninsula, and extended their rail connections accordingly. As a result of the Russo-Japanese War the Russians lost Kwantung and the railroad south of Changchun. All and more has been regained since World War II ended. The Soviet Union now has a firm grasp on all of Manchuria.

British capital built the important railroad between Peiping and Mukden. The Japanese built most other lines in Manchuria. These railroads have more than ordinary significance. There are few roads in Manchuria, and only some 6,000 miles suitable to automobile traffic. Though there are navigable rivers, most commerce is handled by rail. The railroad companies, in addition to serving their normal functions, have played an important role in developing the country; policing lands along their tracks, selling lands to settlers, locating the sites of towns, and developing natural resources. They also made it easy for Japan to acquire control of Manchuria in 1932, when the Japanese formed the puppet state of Manchukuo.

The Japanese deserve much credit for bringing stability to Manchuria and raising standards of personal security. They established many industries and exploited natural resources with a vigor unknown during days of Chinese rule. Few Japanese, however, could be induced to colonize—fewer than 100,000—in spite of attractive bonuses. The profits from Manchurian enterprises were of little benefit to the Chinese; they went to Japan.

The most extensive lowlands follow a northeastward trend from the Gulf of Pohai toward the Amur River. The Liao Valley occupies about the

southern third of the lowland and the Sungari Valley the remainder, the divide between the two lying close to Changchun. Moderately arid lands to the west rise to increasingly higher levels, culminating in the Great Khingan on the boundary of the Dry World. East of the lowland, toward Korea and the Far Eastern Area of the Soviet Union, are several distinct ranges which are wet enough to bear extensive forests. These are largely volcanic and culminate in peaks rising to about 9,000 feet.

Winds from the Polar-Siberian air-mass sweep southward during the winter, bringing intense cold at times but little moisture. During this dry season the temperature at Mukden is likely to drop to -30°F. , though the latitude is the same as that of New York or Barcelona. Rivers freeze solidly. Winds from Pacific air-masses sweep inland during the warm season. About half of the annual precipitation is concentrated in the latter half of the summer. A short growing season lasts from these rather late rains until the first killing frosts of early fall.

About half of Manchuria has somewhat arid climate and steppe vegetation. This is a region of pastoral nomadism. About a third could be cultivated, of which about three quarters is actually under the plow. About one quarter of the country is forested. A valuable mixed forest, similar to that of the eastern United States, lies at lower elevations. Conifers are associated with such trees



Manchuria: railroads

as oaks, elm, ash, and beech. A taiga-like forest lies above, dominated by such trees as pines, firs, larch, spruce, and birch.

The fertility of the Liao and Sungari valleys is due to moderate precipitation, under which a natural grassland soil has developed. Millet is the leading food crop, a surplus being exported to Korea. Barley grows in higher and drier places and a great deal of wheat is harvested on the lowlands near Harbin. A single crop of rice or maize can be grown in parts of southern Manchuria, where the short growing season is sufficiently hot. Vegetables, sugar beets, tobacco, hemp, and soybeans are common crops.

The soybean is noteworthy because it has so many uses and for the reason that it supplies about half the value of Manchuria's exports. It is used in various forms as food: as a vegetable, flour, cheese, sauce, or milk. It has many industrial uses. The oil serves as an illuminant and in many other ways; husks are used as fuel; and pulp is used for making artificial silk. Being a legume, the soybean has a beneficial effect in adding nitrogen to soils. The fodder is excellent food for domestic animals.



Soybean cakes, Dairen
(U.S.D.A. photograph,
Dorsett and Morse)

About 85 per cent of the population is rural and predominantly agricultural. Though mechanized farming would greatly increase the efficiency of individual farmers, the Chinese cling to methods brought from an overcrowded country and resist innovations of all sorts.

Mineral wealth is considerable, but only slightly exploited. Gold, copper, manganese, lead, and other metal ores are mined. Coal reserves are large, particularly in the south where all the basic ingredients of heavy industry exist. About four fifths of the coal now produced comes from the vicinity of Mukden. One bed near Fushun has the astounding thickness of 400 feet. Low-quality iron ore is abundant nearby. Oil-shale, from deposits 250 miles inland, is refined at Dairen, on Kwantung Peninsula.

Mukden (Shenyang; 1 million), an old Manchu capital and leading city of southern Manchuria, has witnessed spectacular growth in recent years, its population having doubled since 1930. Around an old walled city the Japanese have developed a modern district that hums with commercial and industrial activities. Textiles, machinery, food products, pig iron, and steel are principal manufactures. About one tenth of the population is Japanese. *Dairen* (556,000) is an ice-free port and center of agricultural processing. *Antung* (315,000), on the Korean border, produces iron and is growing as a center of heavy industry.

Changchun (Hsinking; 544,000), the recent capital, is about 20 per cent Japanese. It is the rail hub of central Manchuria, with lines leading to Mukden and Dairen, Peiping, Siberia, Harbin, and Rashin, a new port in the extreme northeast of Korea. Forest and food industries supplement commercial and political interests.

Harbin (Pinkyang; 662,000) is the traditional center of

Russian influence. The Sungari is navigable for about half of the year to Khabarovsk, near the junction of the Amur and Ussuri rivers and sleds transport goods over frozen ground in winter. The natural direction of trade is northeastward, toward Soviet territory. Industry is confined largely to food processing.

KOREA

Korea (Chosen, Calm Dawn Land) is the hard-luck nation of the Chinese Realm; like Belgium, it has been the theater of many wars. Its major invasions have been by Chinese in 220 B.C., Japanese in A.D. 1, Chinese in the tenth century, Japanese, Chinese and Mongols in the seventeenth century, and Japanese in 1905. It was formally annexed to Japan in 1910 and since World War II has been sharply divided along the parallel of 38° N. into zones of Soviet and American occupation. Each section became an independent republic, with the Soviet Union dominating the northern. In 1950 an attempt of the Communistic Republic to capture the Republic of South Korea was resisted by the United Nations.

The Koreans are modified Tungus, predominantly Mongoloid but with enough Caucasoid admixture to give them a tendency toward brown hair and rather fair skins. Fears and taboos, coupled with extreme conservatism, render it difficult to assist them in raising living standards or improving health conditions. In rural sections the infant mortality rate commonly exceeds 50 per cent. Easy-going to the point of shiftlessness, the Korean follows primitive agricultural practices. As in China, much fine land is occupied by cemeteries; burial mounds dot all landscapes of settled regions.

Notable improvements accompanied Japanese occupation, such as doubling agricultural production, greatly modernizing the communications system, and the initiation of industrialism, but the profits have all gone to the Japanese. The lot of the Korean actually became worse. The production of cereals increased by one third between 1920 and 1940, but the population increased by 40 per cent, leaving less food per person. Worse than that, most of the increase went to Japan, so that Koreans actually went hungry.

Korea has an area of 85,000 square miles, about that of Minnesota or somewhat larger than New England. The population of 28 million included 600,000 Japanese at the start of World War II; more than that number of Koreans were living in Japan. Population increased rapidly during the period of Japanese occupance, from 13.3 million in 1910. Literacy also rose notably, but fewer

than one fifth of all children had an opportunity of attending school.

Physically the country is essentially a plateau of old rocks that rise in elevation toward the north. The descent to the east is steep. That to the west is more gradual and the plateau is dissected by a complicated system of valleys. The productive lowlands lie to the west and south. Winters are severe in the north, but the isotherm of January 32° F. lies north of the southern lowlands, where the climate is about like that of New Jersey, except that monsoon influences concentrate most of the rain in summer. About 80 per cent of the country is rugged and nearly 75 per cent in forest, the trees being predominantly coniferous. About 20 per cent is cultivated and about 80 per cent of the population is agricultural.

One third of the cultivated land is planted to rice, irrigated paddy fields being concentrated on the southern lowlands. The Japanese increased the productivity greatly, but required that more than any local surplus be sent to Japan. Koreans had to turn to Manchurian millet to meet their own cereal needs. Barley, the chief item in Korean diet, is the crop of second importance. Millet and some wheat are grown in the northwest, where the climate is too severe for rice. Maize, sweet potatoes, soybeans, Irish potatoes, cotton, hemp, tobacco, and fruits are other leading crops. Double cropping is limited to the extreme south. Mulberries are rare and little silk is produced.

Fishing ranks high among occupations along the south and west coasts. The annual catch exceeds by 50 per cent the value of that of Europe's leading fishing nation, the United Kingdom. Most of the fish are dried and salted, a large share being exported to Japan.

Mineral resources include gold (first in value and mined in the northwest), iron ore, coal, copper, silver, tungsten, and graphite. The coal reserves are quite large and contain anthracite and other valuable varieties.

During antiquity Korea vied with the Wei Valley of China for intellectual leadership in the Oriental World. Much of the culture of the early Japanese came directly from Korea and to Korea went intellectuals from both Japan and China for education. Having suffered so many ravages at the hands of foreigners, the Koreans many centuries ago turned isolationist. The land became a "hermit nation" which in every possible way tried to avoid foreign contacts. The Yalu River became a sharp cultural boundary against Manchuria and a political line that persists today. The desires for peace and self-sufficiency were not realized.

Within the present century Korea was reduced to a vassal state serving chiefly as a source of raw materials for its aggressive neighbor, Japan, only 120 miles distant from its south coast.

Seoul (Keijo; 1.4 million), the capital, is the one large city. Its interests are commercial and political. The port, *Jinsin*, lies about twenty miles away. *Fusan* (Pusan, 474,000), the main port for commerce with Japan, is located in the southeast. *Rashin*, in the extreme northeast, is an outlet for Manchuria. *Heijo* (Pyongyang, 450,000), in the northwest, lies near the best coal mines and is the industrial center. The main exports are rice, cotton, fish, gold, coal, and iron ore.

FORMOSA

Isle Formosa (Beautiful Island), was named by the Portuguese in the seventeenth century. The Chinese name, Taiwan (Terrace Bay), was applied later. Both are appropriate for this beautiful 260-by-90 mile island, with its many cliffs and flats. Along the Pacific shore are some of the highest cliffs in the world, extending for a distance of 25 miles and rising in places more than 6,000 feet above the ocean. Few harbors occur along this rugged coast. The hinterland culminates in such peaks as *Niitaka* (Mt. Morrison), over 13,000 feet high, and *Taihasen* and *Nankodai-San*, which are nearly as high. The western two thirds of the island is characterized by widespread flats that descend like the treads of stairs to the coastal plains along Formosa Strait. Mangrove swamps line much of the immediate coast.

Agriculture suffers from excessive precipitation except along the west coast where the rainfall is but 40 inches per year. A sharp increase with elevation leads to values in excess of 300 inches. January to April is a somewhat drier season over most of the island, but in the extreme north there is a slight winter maximum. A typhoon now and then strikes with full force along the east coast.

About 70 per cent of Formosa is forested, the variety of trees being enormous and including ebony, the giant *Taiwania*, camphor, cypress, Chinese juniper, red cedar, oaks, and members of both tropical and mesothermal rain forest communities. Cedar and other timber are exported. The distilling of camphor has been a government monopoly, important because the island met three quarters of the world's needs prior to World War II. This industry may suffer severely from synthetic substitutes which came into widespread

use during the war. Camphor wood is one of the many desirable cabinet woods grown on the island.

Bamboo, bananas, jute, ramie, oolong tea, and pineapples are important products that might be expected on a Pacific island cut by the Tropic of Cancer. Two rice crops are cultivated with the help of water buffalo on terraces and paddy fields on the western lowlands. A surplus of about half of the harvest has been going to Japan. Sweet potatoes, peanuts, and soybeans are the main crops of unirrigated fields. Sugar-cane growing has assumed considerable importance in recent years, both along the west coast and toward the northern end of the island. Over 40 per cent of the export in 1937 was sugar, shipped to Japan. Rice, tea, bananas, and pineapples were also sent in large quantities.

Malays and Indonesian peoples have lived in Formosa for well over 20 centuries. Of this aboriginal element in the population about 100,000 *Chi-huan*, raw savages, now inhabit remote highlands. Many of these are head hunters who live in fear of outsiders, but who ordinarily become friendly enough when presented with beads or other simple gifts. About half as many *Pepo-huan*, semi-civilized aborigines, come into closer contact with the oriental civilization of the lowlands. These primitives are organized into several main tribes and inhabit some 700 villages in the mountains.

The Dutch were the first outsiders who attempted to control Formosa, establishing a fort near Tainan on the west coast. The Spaniards promptly challenged Dutch control by erecting two forts at the northern end of the island, but withdrew in the face of Dutch resistance. When the Ming dynasty fell, some 100,000 Chinese arrived as refugees. These disputed Dutch authority and caused the latter to withdraw in 1662. In 1683 the island became part of the Manchu Empire. The Japanese made an unsuccessful bid for Formosa in 1874, but obtained possession in 1895 during their war with China, remaining in control until the end of World War II, when sovereignty was returned to China. In the recent fall of China to Communist control, Formosa remained as the last territory under control of the Nationalist government.

Of a population of nearly 8 million, well over 90 per cent are Chinese and only about 300,000 Japanese. This is not because Foochow is less than one sixth as far away as southern Japan. In all parts of the Orient when two peoples come into contact on a competitive basis, those with the lower living standard always win out. The Japanese are unable to compete with the Chinese in

agriculture or trade. Formosan cultural landscapes thus became Chinese. Two-wheeled carts, many pigs and ducks, and Chinese villages dot fields supporting population densities in excess of 1,500 per square mile. The Hok-Lo of the north speak Amoy and the Hok-Ka of the south speak Mandarin, the two main languages of Formosa.

Japanese control brought considerable progress. Population doubled, from about 3 million in 1905. Destructive raids by aboriginal tribes were reduced to insignificance by 1910. Mineral resources were exploited diligently. Considerable coal is mined on the northern end of the island, some being used to smelt bauxite imported from the Netherlands East Indies. Gold, copper, sulphur, and phosphorous are produced in moderate

amounts. A small petroleum output has been developed.

The best harbor is Kūrun (Keelung), near the northeast point of the island, serves the capital, Taipei (Taihoku; 327,000), some eighteen miles to the west. This walled city has three sections, one of which is modern. In addition to commercial and political functions it supports a university. *Tainan* (150,000) and Takao, commercial and agricultural centers, are served by the port of Toko near the southern end of the island. The rail net is best developed on the western lowlands, but lines also run for more than half of the distance along the rugged east coast.

45: Japan

Japan proper extends northeastward across latitudes ranging from about 30° to 45° N., equivalent to those from New Orleans to Minneapolis, or northern Florida to the northeastern coast of Maine. The four main islands of Honshu (89,000 sq. mi.), Hokkaido (Yezo; 34,000), Kyushu (16,000), and Shikoku (8,000) have about the area of Montana. Upon them and many small islands nearby live about 84 million people. Population density approaches an average of 500 per square mile, but this figure means less than the fact that there are more than 3,000 per square mile of cultivated land.

The pre-World War II Japanese empire attained a maximum extent of 3.25 million square miles and population of 300 million in 1942. Much of the territory was recently acquired and not really assimilated. Prior to the aggressions starting with Manchuria in 1931, the empire consisted of Korea, Kwantung, and some 1,700 islands, the total area being 263,000 square miles and the population, 105 million. Fifty-six per cent of the area and nearly three quarters of the population were in Japan proper. The losses in World War II included occupied parts of China, Manchuria, Korea, the southern half of Sakhalin, Kuril

Islands, Ryukyu Islands, Formosa, and the former German mandated islands in the Pacific, including the Marshalls, Carolines, Marianas, and the Palaus.

CULTURE BACKGROUND

The early inhabitants of Japan were proto-Caucasoid peoples of whom the Ainu remain, possibly about 15,000 being of rather pure stock. These wavy-haired people have brown, but rather fair, skins and a great deal more body hair than Mongoloids. Ainu place names survive in most parts of Japan.

The dominant Japanese stock, however, seems to trace back to mixed Mongoloids whose main strain probably ran back to proto-Tungus and other northeastern Asiatic peoples. The original language may have been Ural-Altaic, but it is now highly modified and enriched with Chinese and other loan words. Adoption of the Chinese method of writing introduced literacy.

Around the Inland Sea developed the Yamato people, characterized by short, thickset bodies, short legs that tend to be bowed, and large heads. These eventually became the dominant Japanese strain. According to legend the emperor Jimmu Tenno, grandson of Amaterasu Omikami, the Sun goddess, was the first ruler in about 605 B.C. Hirohito is supposed to be the 124th in this royal line.

Nuclear Japan developed around the Inland Sea, a water-body over 250 miles long and at places 50 wide, with over 700 miles of coastline between the three main southern islands. With relatively small tidal range, this beautiful sea is practically one great, sheltered harbor. It was easy for the Japanese to acquire skill in handling boats and fishing. Like East Indians, but unlike most other Oriental World peoples, they acquired a taste for raw fish. As population grew they turned to rice cultivation. Southern Japan became *Misano Kuni* ("land of rich rice crops"). For protein they turned to the sea.

The Archaic Caucasoids of Honshu were not easily displaced. Biwa Lake, in the narrow neck between Osaka and Wakasa bays, was long the Ainu boundary. By A.D. 400 the Japanese were in



Japan and the United States: comparative latitudes

nominal control of Honshu, but not until the tenth century was the conquest complete.

By the eighth century few Ainu remained in lands south of the isotherm of January 32° F., which was about the northern limit of rice raising at that time. The capital was moved to Nara, east of Osaka Bay, and the Japanese were in firm possession of the coasts of the Inland Sea. Japan had begun to assume a place in the Chinese Realm of the Oriental World chiefly through adoption of mainland culture traits. Confucianism, Buddhism, logograms, and various arts appeared. On the fighting front developed military rulers, the Shoguns, who later plunged Japan into a Medieval period.

Edo (Tokyo) and other march sites resembled Berlin in acquiring political control as headquarters for fighting forces. Between 1615 and 1868 the Tokugawa Shogun in Edo was the *de facto* ruler of Japan, various current emperors being of little consequence when members of families of all regional governors were being held as hostages of the Shogun to make certain that no district would rise against his authority. The Meiji Restoration marked the fall of the Shogunate in 1868.

Though Portuguese, Dutch, and other outside influences penetrated Japan's isolation during Shogun rule, modern times appeared with suddenness unparalleled elsewhere after the Meiji Restoration. Renaissance, Commercial and Industrial Revolutions, Westernization, Empire, and World War II appeared with a rapidity equivalent to compressing the history of Europe since the fourteenth century into a span of less than 90 years.

Japan is sometimes regarded as the "Britain of the East." Like Britain it has enjoyed insularity coupled with proximity to a highly civilized continent from which it could borrow what it chose. Its wars with foreign powers have been fought on foreign soil. Its cultural nucleus was a tract of excellent agricultural land. Seafaring and fishing interests loomed large. Japan has enjoyed even greater freedom from invasion.

Kublai Khan, after two unsuccessful invasion attempts and a brief landing on Kyushu, abandoned the idea of capturing Japan when a typhoon ("divine wind") is said to have sunk some 1,300 of his invasion craft with a loss of 170,000 men in 1281. The only foreign armies that have occupied Japan arrived at the end of World War II.

Japan has differed from Britain in many ways. Various measures were felt necessary to preserve Japanese culture and Shogun power. For about 250 years, ending in 1868, no citizen was permitted to leave the country. All ships larger than coastal fishing craft were destroyed in 1700 in

order to keep the islands isolated and their culture uncontaminated. Trade with outsiders was sharply controlled. The building of a merchant fleet came very late.

PHYSICAL BACKGROUND

A festoon arrangement of island arcs partially encloses a number of large seas along the eastern coast of Asia. The Bering Sea lies behind the Aleutian arc; the Sea of Okhotsk behind Kamchatka and the Kuril arc; Tatar Strait and the Sea of Japan behind Sakhalin and the Japan arc; and the South China Sea behind an arc including Formosa, the western Philippines, and northern Borneo. Some of these seas are deep, but the world's deepest waters lie just outside of the convex sides of the arcs in troughs, known as *deep*s, that sink far below the general level of the Pacific floor.

Geologists have speculated about the origin of the arcs and deeps and have advanced several theories. What is certain is the fact that they are still in process of formation, as evidenced by crustal unrest, numerous earthquakes, and intense volcanic activity. Hokkaido has a peculiar, kite-shaped outline because it is a junction point in the arcuate system. Japan rises as a high and complex mass of mountains above a floor more than two miles below sea level in the Sea of Japan and a trough more than five miles deep in the Pacific. Such structural outlines and high relief could not persist in the face of erosion were not their causes actively operating.

Several mountain chains paralleling the coast of Japan are composed of highly folded and rather ancient rocks. The Japanese Alps of central Honshu are a confused knot marking a change in



Ainu (from E. A. Hooton, *Up from the Ape*. Copyright 1946 by The Macmillan Company)

trends from about north-south to more nearly east-west. All ranges are divided into complex mosaics of elevated and depressed blocks by faults. Many of these are active. Offsets between marginal blocks cause about 15,000 earthquakes per year.

Tokyo feels an earthquake on an average of every third day. The great majority of shocks are extremely light and do no damage whatever but some earthquakes have brought major disasters. The Tokaido earthquake of 1498 killed 20,000 people in northern Japan. In 1792, 15,000 were killed on Kyushu. The toll in 1896 was about 30,000, caused by a sea-wave along 250 miles of coast. These waves ordinarily result from crustal readjustments below the ocean surface. Most of the nearly 100,000 killed in 1923 were victims either of a sea-wave or fire following shocks centered in Sagami Bay, near Tokyo.

There are some 500 volcanic peaks in Japan, about 10 per cent of which have been active within historic time, and half of the latter are more or less active today. Most of the volcanoes lie along the east coast, but some along belts that trend inland, crosswise to the folds of the older rocks beneath. Fujiyama (Fuji; Fuji San), famed for the symmetry of its cone, rises to an elevation of 12,461 feet, about sixty miles southwest of Tokyo. Forests climb to 8,000 feet and the rocky summit remains covered with snow for most of the summer. Some 50,000 people ascend its sides each year to view a crater which has been active

intermittently during historic time. Minhara, on Oshima, south of Sagami Bay, is another beautiful mountain. Asamayama, about eighty-five miles north-west of Tokyo, is the most active volcano today and a favored spot for suicide by leaping into its crater. Bandai San, 125 miles north of Tokyo, buried four towns and destroyed much of Nagase Valley during a violent explosive eruption in 1888. Nearby Asuma burst into activity in 1893. Some 1,200 mineral springs, quiescent expressions of volcanism and active faulting, provide the Japanese with many resorts and promote faith in curing ailments by bathing.

Japan is so mountainous that less than one quarter of its surface has a slope of less than 10° (one foot vertical rise in a horizontal distance of seven feet). The flatter lands include much useless territory, such as stony valley floors and wet coastal marshes. Less than one fifth of the area is potentially agricultural and only about 16 per cent is actually cultivated. As recently as 1880 less than 10 per cent was in use. Typical valleys lead through rough terrain. Swift torrents sweep trains of stones along valley floors. No stream is commercially navigable for more than a few miles near the coast.

Communications are expensive to develop in such rugged country. Though the airline distance from Kyoto to Tokyo is only 230 miles, the overland trip from one to the other took as much as three months before 1868. The modern railroad winds 340 miles between them and fastest trains require about eight hours for the trip. There are some 60,000 miles of road in Japan, but mostly narrow and poorly constructed; less than 8 per cent of the mileage is reasonably good automobile highway. Railroads are excellent, and have a combined length of about one fourth that of cart roads. Most of the lines are operated by the government. About two per cent of the mileage is electrified, mostly in the vicinities of Tokyo and Osaka.

Old-rock areas provide a fine supply of pure water, which is excellent for dyeing, bleaching, cloth-printing, and paper making. Steep gradients favor development of hydroelectric power, especially where the rainfall is abundant and not sharply seasonal, a condition which is rather widespread. Estimates vary widely as to the hydroelectric potential and the extent to which it has been developed. Possibly half of the most useful horsepower is harnessed. More than half of the power is used industrially. Coal is used to generate about one-quarter as much electricity as water power. Electricity is used widely and possibly no other country has so great a proportion of wired rural homes. Conservation measures limit do-



Japan; index map

mestic use sharply, however, so that few lights are permitted in homes and heating is generally prohibited.

Japan has a great variety of mineral deposits, but all resources are in small supply. Copper is the most abundant metal and was being exported until 1920. In years just prior to World War II the supply met only about two thirds of local needs. Gold and sulphur have been exported in considerable quantities. Coal, copper, and gold ordinarily account for about three quarters of the value of mineral output. In the 1930's Japan produced most of the chromium it used; about one third of the zinc, manganese, and salt; about one quarter of the tin; one sixth of the iron; and one twelfth of the lead. The iron ores are concentrated in northern Honshu and in Hokkaido. Imports came from China, Manchuria, Malaya, India, and included large amounts of scrap iron from the United States.

Most of the coal is of poor quality, but it sufficed to meet 90 per cent of fuel needs prior to World War II, and accounted for half of the value of mineral production. Northern Japan depends on local supplies, but two thirds of the output comes from northwestern Kyushu. The northern reserves are largest and cheapest to mine. In Kyushu the seams are thin and require more energy for mining than would be economic in most countries. It is estimated that Japan's coal will be exhausted in about two centuries. Coking coal has been imported, chiefly from Manchuria and French Indo-China. About 10 per cent of Japan's pre-war petroleum needs were met by small fields along the western side of northern Honshu, the northern tip of Hokkaido, and northern Kyushu.

The isotherm of January 32° F. approximates Tokyo and just about divides Japan into equal parts. Temperatures to the north are similar to those along the Atlantic coast from New Jersey to Maine and those to the south resemble seaboard temperatures extending into Florida. No important ports are frozen in winter. Precipitation is heaviest in the south, in excess of 100 inches in places, and decreases northward to about 30 in the lowlands of Hokkaido. The average for most of Japan is about 40, as in the eastern United States. Drought is practically unknown.

Unlike conditions in the eastern United States, there is a well-developed monsoonal influence in weather. Maximum rainfall comes during summer when winds from Pacific air-masses blow toward Asia. During winter there is a precipitation maximum along the west coast of Honshu, resulting from moisture picked up by winter winds blowing over the Sea of Japan. On descend-

ing slopes toward the Pacific these winter winds are dried (föhn or foehn effect), bringing a fairly dry and sunny season. On the whole, Japan is wetter and colder than other islands in its latitude. Its west coast remains cool and cloudy much of the time, but winter temperatures are mild because northwest wind drifts warm water toward Japanese shores. Typhoons do considerable damage about once or twice a year along the southern coast. Northern Honshu lies beyond most storm tracks, which recurve from northwestward courses in Philippine latitudes toward northeastward in the North Pacific Ocean. In both the northwestern Atlantic and Pacific oceans, the territory of intense fog lies beyond storm tracks.

Over half of Japan is forested, about 15 per cent is covered with coarse grass, and about 8 per cent is rough, stony land, *gen-ya*. Broad-leaved trees of the Mesothermal rain forest grow at elevations under 4,000 feet in southern Kyushu. The upper limit of this forest descends to sea level, with the isotherm of January 32° F., in central Honshu. Camphor, palms, evergreen oaks, and many trees typical of southern China grow in the rain forest. The most striking grass is bamboo. Next higher in elevation and latitude is the mixed forest, with such trees as maple, weeping willow, magnolia, beech, chestnut, ash, Japanese cypress, Japanese cedar, arbor vitae, firs, hemlock, and pines. The mixed forest rises to 5,000 feet in central Honshu, descending to sea level in northeastern Hokkaido. Above it lies the taiga, with birch, spruce, and firs. Altogether, about half of the acreage of Japanese forests is dominated by conifers.

Hokkaido, with but one fifth of total forest area, accounts for about half of the return from timber. Though important as natural resources, Japan's forests amount only to about three quarters of an acre per capita; whereas each person in the United States has a quota more than six times as large. Reforestation has been pursued diligently, with a result that forest area increased 13 per cent between 1915 and 1936. Forests have given prominence to wood and paper industries and have made Japan a land of wooden buildings and fire hazards, where truly old structures are rare. Domestic heating is almost wholly dependent on oak or pine charcoal, burned in braziers. The annual value of manufactured charcoal is almost equal to that of timber. In spite of its lumber industry and supplies of such woods as pine, sugi (*cryptomeria*), and hinoki (*cypress*), Japan ordinarily imports timber from Manchuria and the Pacific Northwest.

AGRICULTURE

In 1920 over half of the population was engaged in agriculture. Twenty years later the proportion dropped to 40 per cent, but the number of farmers remained about constant; total population had increased. Farms average 2.7 acres, but nearly three quarters of them are below that size. Over half of all tilled land is in rice and each acre produces about twice as much as in Java, where standards of agricultural productivity are high for the Orient. Two crops are raised per year in Kyushu and Shikoku. In southern Kyushu the acreage of crops harvested each year is practically twice that of cultivated land; for Japan as a whole it is about one-and-one-quarter times. This indicates the significance of double cropping.

The combined acreage of wheat, rye, barley, oats, and maize is about half that of rice. Wheat is relatively widespread, on lands lying above irrigated rice fields. Maize and millet are raised on porous and well-drained soils. Oats grow in the northwest and wetter parts of Hokkaido. Rye is grown not only for grain, but for its straw, which is used for straw hats and many other purposes. Sweet potatoes and taro are important food crops in the south. Common vegetables include cabbage, peas, soybeans, beets, carrots, lettuce, celery, and onions. Rape seed and peanuts are sources of oil used in cooking; both are important crops near Tokyo.

Peppermint, tobacco, sugar cane, flax, hemp, pyrethrum, and reeds and rushes are significant crops. Tobacco-raising centers near Tokyo and is a government monopoly. Mulberries occupy nearly one tenth of land under cultivation, well over a million acres of sloping territory south of Sendai. Japan supplied about three quarters of the world's silk prior to World War II. Tea covers a comparatively small area, less than that of the relatively unimportant crop, buckwheat. Most tea raising is concentrated in the Shizuoka district, on slopes between Yokohama and Nagoya. Other tree crops include oranges, mandarin oranges, loquats, peaches, plums, cherries, persimmons, pears, and apples.

Japan comes closer than the United Kingdom to providing its own food, in spite of great population density and large proportion of non-agricultural land. Its colonies accounted for only about one sixth of the rice consumed and such luxury items—to the fish-and-rice-eating Japanese—as meat, eggs, sugar, bananas, and pineapples. Little agricultural land is used for nonessentials, as in China, Korea, and other Oriental countries.

Houses, towns, and roads are located on stony or barren areas wherever possible, so that better lands may be more fully given to the plow.

While some oxen are used in the rice fields, Japan does not try to support a large animal population. Fewer than 2 million cattle and 1.4 million horses were being fed in 1939. The annual per capita milk consumption was less than one gallon and each person ate less than four pounds of meat. Sheep are almost nonexistent, partially because the drier lands where they might graze grow sharp-edged grasses that cut their tongues. Almost all wool is imported.

Inheritance of farms by only one person in the family (ordinarily the eldest son) prevents subdivision into absurdly small plots. Other children normally go to the cities. Even so, the farms are too small for maximum productivity and efficient operation. There are about 1,200 farmers per square mile of tilled land. As in England and a great many other countries, there is a tendency for farms to grow larger; an increase of about one-quarter acre came between 1903 and 1939.

FISHING

Whether measured by tons or value, the Japanese empire accounted for about one third of the world's fish catch in pre-war years, and Japan proper brought in over half of the total. The return from fishing was about 10 per cent that from agriculture, and directly or indirectly supported about 20 per cent of the population. Nearly 1.5 million persons fished, but about half of them had other occupations as well. Some 350,000 fishing boats plied waters along nearly 18,000 miles of coast around the 550 habitable islands of the Japanese group. Only one boat in five had an engine. Half of the world's fishermen were Japanese.

Over half the catch was sardines; herring ranked second. There are no great banks, but the most favorable grounds are along the west coast north of 37° N., in places where cold and warm ocean currents meet. In cold water are cod, herring, sardines, sea trout, and halibut. In warm are tunny, sardines, albacore, tuna, mackerel, sailfish, and various kinds of swordfish. Sea bream from local waters is the favorite among Japanese. Only 7 per cent of the catch was sold as fresh fish. The remainder was dried, salted, ground into meal, or processed in other ways for food or fertilizer.

Halibut fishing is best in summer off the shores of Karafuto. Floating canneries go north after crab and salmon, but there is increasing competition from Soviet fishermen in those waters, and

it is likely that Japanese activities face curtailment. Crayfish (Pacific lobster), shrimp, prawns, and crabs are obtained in Pacific waters. Whalers and factory ships visit all parts of the Pacific and waters surrounding Antarctica, bringing back oil, meat, leather, and fertilizer. Squid and octopus supplement diets, as do various seaweeds. The latter are also used for making paper, glue, and for recovering iodine. One of the interesting occupations along the coast is raising culture pearls, a process requiring the introduction of a tiny foreign particle between the flesh and shell of an oyster-like mollusc, producing an irritation that commonly results in the growth of a pearl of marketable size after four or more years. Culture pearls are a major export. Another interesting occupation is widespread fish culture.

RENAISSANCE

Prior to the middle of the last century Japan was a land of local economy, subsistence agriculture, and factories without mechanical power. The population had been stabilized for well over a century at 30 million, for whom there was just about enough food when everything went well. Death rates were high and birth control and infanticide were commonly practiced. A typhoon or other disaster brought local famine and a good many deaths. With the fall of the Tokugawa shogunate and restoration of Emperor Meiji in 1868 came a renaissance such as no other part of the world has ever experienced.

An agrarian revolution accompanied abolition of the feudal system, "dispersing" the Samurai, and parceling the lands of the nobility among their tenants.

Shinto (Sinto; "way of the gods") was emphasized with vigor as a religious philosophy and nationalistic propaganda. Its doctrines emphasize conservatism, simplicity, reverence for the emperor and other great people, veneration of heroes, and cleanliness of the body. As gods it recognizes millions of people and things, from the Sun goddess, Amaterasu Omikami, one's ancestors, on down to rivers, trees, and rice pots. Shinto offers neither heaven nor hell. In recent years it has tended, more and more, to emphasize the greatness of Japan and the Japanese. Over 100,000 shrines are spread throughout the country and regularly visited by people who regard frequent baths as essential and who hold that "the cherry is the best of flowers; the soldier is the best of men."

Face, an oriental form of prestige that is unable to bear acknowledgment of mistakes, is practically a religion in Japan and China. Suicide

is the honorable way to save one's friends and family from the stigma of failure. Europeans tend to overemphasize suicide among Japanese, however; many European countries actually experience higher rates than Japan.

Buddhism ("belief in the future") combines nicely with Shinto ("belief in the past") so that Japanese have no difficulty in belonging to both religious groups. The 100,000 Buddhist temples are ornate, whereas those of Shinto are simple. Japanese Buddhism has recently become a progressive influence, quite unlike the dead hand of Lamaism in the Dry World. Buddhists have stood foremost in advancing education and various arts and crafts.

Christianity ranks far behind Buddhism in number of followers, but there were many churches, and the Roman Catholic Church was headed by an Archbishop in pre-war Japan.

The educational system was highly restricted in feudal Japan. Scholars went to China and Korea at various times, but fear that education might result in destroying the hold of the governing class and declining prestige and power of mainland nations prevented any great number from being sent abroad during Shogun times. With renaissance came an amazing development. Leading scholars were imported from Europe, along with many skilled technicians, who soon taught their specialties to the Japanese. The latter learned rapidly and passed their knowledge on to others, so that soon an educational revolution was under way such as no other country has ever experienced. No other part of the Oriental World approaches Japan's literacy. Japan developed a number of great universities, with enrollments of 10,000 or more. Its scientists have become famous in many fields.

Unique among Oriental World countries in willingness to adopt Occidental ways, Japan rapidly made commercial and industrial gains that placed it on a par with European nations. It differed, however, in a fundamental way because it practically failed to develop a middle class. A profound gap remained between the masses of common people on one hand, and the rulers, military leaders, and possessors of wealth on the other. An outcast class, Eta, is no longer recognized legally, but persists socially. This group arose among those who slaughtered animals or dealt in flesh and hides (occupations which rendered them unclean according to Buddhist doctrines), criminals, and others who were relegated to the lowest rungs of the social ladder.

In establishing European-type industry only the

government had sufficient capital to build factories or finance them. Manufacturing thus became sort of a regimented feudalism, where the former peasant left the land of some noble to work in the factory of an equivalent person in the employ of the government. The first modern industries were textile mills, match factories, cement plants, ship yards, munition works, and porcelain works. Though of necessity being forced to assume the position of proprietor at the beginning, the government was not anxious to monopolize industry. Once the enterprises were firmly established they were sold to private interests at absurdly low prices. These transfers took place between 1880 and 1893. Even at small percentages of original cost, only a few "families" had sufficient capital to take over. Thus developed the *Zaibatsu*, or financial clique which not only gained control of almost all important industry but practically all banking, shipping, and most of the commerce as well. Between the great wealth of such "families" as the Mitsui, of the *Zaibatsu*, and the meager resources of the common people was a gap equivalent to that between noble and serf. Some five "families" controlled 70 per cent of the banking, 35 per cent of the foreign trade, over 50 per cent of the coal mining, and owned almost the entire merchant fleet.

The Chinese War of 1895 resulted in a huge indemnity that stabilized the currency. World War I brought such enormous profits that the entire industrial machine was modernized and placed on a par with those of the world's leading nations.

Though the Portuguese, English, and other foreigners traded with Japan at various times since the beginning of Europe's Commercial Revolution, and the Dutch maintained a trading post near Nagasaki since 1641, Japan's over-seas commerce really started after 1858 when a few ports were opened to foreign ships. Eventually the list grew to seventy. Early trade was unimportant and was carried wholly in foreign bottoms. Prior to 1868 no Japanese was supposed to own or build a ship of over 50-ton weight. Only pirates seem to have violated the edict. The first steamship company was organized in 1874. By 1939 the *Zaibatsu* owned a tonnage ranking only behind that of the United Kingdom and the United States.

The first railroad was an 18-mile line from Tokyo to Yokohama built in 1872. The first Japanese locomotive was built in 1893. By 1936 Japan had half as much railroad mileage as Great Britain.

Specific milestones in Japan's Industrial Revolution include a great boom in the textile industry

following the Chinese War, a similar boom in chemicals and machinery after the Russian War, and a tremendous increase in shipping after World War I. A nation with such experience might well assume that only progress might come from World War II.

Textile industries normally employ about half of industrial labor and account for about two thirds of the value of exports, if both raw and processed silk are included. The greatest specialty of all is silk yarn. Much of the cloth is of poor quality. A large cotton industry depends on fibers imported from India and the United States. A woolens industry also depends on imports, about 90 per cent of which come from Australia. Between 1926, when the first artificial silk was produced, and 1937 Japan rose to first place in the manufacture of synthetic fibers. The edge over the United States was narrow and was later lost. The basic ingredient was pulp from Karafuto and the North American taiga. In pre-war years Japan was sending more cloth to India than were the British and had become the chief source of textiles for many other oriental countries, and exporter to other parts of the world.

Immediately before World War II the output of metal industries rose to equal the value of textiles. This condition was tied in with preparation for war and will likely not continue. Japan stood second only to Sweden in the manufacture of matches and ranked only behind the United States and Germany in making cement.

The tempo of increased industrial production during the 1930's is shown by a doubling of the number of factory workers between 1931 and 1937 and a tripling of industrial output. Between 1936 and 1939 the number of factories increased by 50 per cent and output doubled. Factories remained small, however, 70 per cent employing fewer than fifty workers and 50 per cent fewer than six. Many were hardly more than family workshops, the typical factory of the Oriental World. Though employing only about one third as many workers as agriculture, Japan's industry brought over three times the monetary return.

KINAI PLAINS

Unlike England, where industrialism resulted in development of a new part of the country and shifting of areas of greatest population density away from the agricultural culture hearth, Japan's culture nucleus became its leading manufacturing center. The Kinai Plains, *Misuhono Kuni*, a lowland extending from the Inland Sea toward Biwa Lake, became one of the world's great population nodes, with more than 9 million people. Two

thirds of the residents are engaged in industry or commerce.

Osaka (2.0 million), both the "London" and "Manchester" of Japan, stood foremost among Japanese cities both before and after the concentrated Industrial Revolution. Founded in the seventh century A.C. by Japanese from the western end of the Inland Sea, made capital in the fourth century A.D., and long kept an open port for Buddhist and other missionaries from Korea and China, Osaka early became a leading political and educational center. It remained Japan's largest city and center of progressive movements until passed by Tokyo in comparatively recent years.

Served by the Yodogawa River and later by canal, Osaka is now a port for 20,000-ton ships. Though coal supplies lie 250 miles distant, on Kyushu, they are available at low cost because water transportation is inexpensive. Copper and other metals are accessible, as are deposits of kaolin. One quarter of Japan's factory workers turn out one third of the country's industrial products in Osaka's factories. There is considerable heavy industry, machine making, ship building, glass manufacturing, and production of chemicals. Large textile mills specialize in cotton. Paper, celluloid, rubber goods, and toys are important products. Agricultural processing includes refining sugar, brewing sake, and the preparation of many foods. Sake, an alcoholic beverage, required a considerable share of the rice crop in prewar years. Extensive slums have grown and a pall of smoke lies over the city.

Kobe (607,000), about fifteen miles west of Osaka, is the "Liverpool" of Japan, a busy entrepôt, leading port, and center of ship building. Its harbor is excellent, best on the Inland Sea. Population is relatively cosmopolitan, including close to 10,000 foreigners in 1939. The city has grown lengthwise along a narrow bench paralleling the coast because rugged terrain blocks expansion inland. Industrial activities concentrate on making highly specialized products that require little factory space, such as matches, toys, and rubber goods. The main interests, however, are commercial.

The Kinai Plains lead inland through agricultural lands that produce not only a great deal of rice but also such crops as vegetables, strawberries, melons, and citrus fruits. In wet and low situations grow large quantities of reeds, used for making the mats that floor Japanese homes.

Kyoto (1.2 million), at the head of the plains, is less than thirty miles from Osaka and one of the really attractive cities in the Kinai area. Unlike the other large cities it contains no European-type core, though many of its lanes were

widened into streets in 1938. As capital for about eleven centuries it developed strong political and religious interests and became famous for its shrines, temples, arts and crafts, and educational institutions. The local river water supply is excellent for dyeing cloth and making paper. Most products from its little, oriental factories are typical Japanese wares, such as silk goods, pottery, lacquered wares, bamboo objects, dolls, toys, porcelains, and small objects of bronze.

ELDER JAPAN

Kyushu early experienced more foreign contacts than the other islands. Nagasaki lies less than 500 miles from Shanghai. The Ryukyu Islands are stepping stones from places long inhabited by Malays. Korea Strait is less than 100 miles wide, with convenient islands along the way.

The island is rugged and volcanic. Some of the vents are active but, as in other places where soils are fertile, farmers do not hesitate to inhabit the sides of volcanic mountains. Some 70,000 live within the crater of Mt. Aso. Though terraces have been built on some slopes where soils are heavy enough to hold water, only one third of the cultivated land produces rice. Bananas, oranges, sugar cane, beans, turo, sweet potatoes, and bamboo cover large areas. Forests are extensive in the interior and horses graze in clearings. Under



Japan: lowlands and cities

such conditions developed the Satsuma culture of Elder Japan, which is still an agricultural and conservative influence.

Villages in the rural southern part of the island are likely to be set deep in valleys, where typhoons are least destructive. Thatched huts string along trails or primitive roads. Individual farm houses are likely to be surrounded by bamboo, and trails lead to fields. Old castles are protected by walls, around which many little urban centers have developed.

The significance of Kyushu now lies in its industry, which is concentrated in a belt along the northwest coast from Moji to Nagasaki. Here are blast furnaces, rolling mills, shipyards, cement and glass plants, and other industries using coal for power. The Chikuhō Basin, above Kurume, accounts for about half of Japan's coal production and is the chief supply of places as far away as Nagoya.

The Moji-Yawata industrial district is an unattractive concentration of coal docks, ore piles, and smoky factories. Though nearly 10 per cent of the country's industrial output, including one third of the pig iron and nearly half of the steel, comes from northern Kyushu, no city has a population of as much as 400,000. *Fukuoka* (393,000) most nearly approaches that size. *Shimonoseki* (150,000), railroad terminus at the tip of Honshu, is connected with Moji by a one-mile-long tube, below the Strait of Shimonoseki, the western outlet of the Inland Sea. *Nagasaki* (253,000) has an excellent harbor and was long the main port for trade with China.

Shikoku is a rugged island consisting of both ancient and younger non-volcanic rocks. Like southern Kyushu it contains extensive forests, produces copper, and is mainly rural. Its limited lowlands have a 300-day growing season and its Kochi Plain produces two rice crops, but of greater value are its resources of timber, camphor, tree wax, bamboo, citrus fruit, and its fishing and paper making.

Across the Inland Sea, along the coast of Honshu, is rugged country with only small hinterlands for its cities. Most notable are *Okayama* (166,000) and *Hiroshima* (286,000). The latter is rebuilding rapidly, after having been the first atomic-bomb target in World War II. Some 69,000 were killed and 176,000 survived. An additional 76,000 moved in between 1945 and 1947 and it is thought that the population will soon climb to 300,000. Many have come to claim property left by relatives or to carry on business enterprises long in the hands of the "family."

In the sixteenth century Edo was a small fishing village and primitive Shogun-Daimyo (politico-nobility) stronghold in backward territory, where winters were a bit cold for the Japanese and earthquakes altogether too frequent. After the period of Shogun control Edo became Tokyo (Eastern Capital). When population pressure forced people from the Kinai Plains and other parts of Elder Japan into territory east of Biwa Lake, the Kwantō Plain—Japan's most extensive lowland—began to develop agriculturally. There are now some 15 million people living upon its 5,000-square-mile surface and 80 towns have populations in excess of 10,000.

Tokyo and Yokohama assumed commercial significance after 1858, when Japan opened some of its doors to foreigners. They faced the Pacific and were logical first ports of call for ships following great circle routes from North America. Ships trying to approximate the shortest, or great circle, route from North American ports follow the Pacific coast northward to the vicinity of Seattle, skirt the Aleutian and Kuril islands, and first sight Japan not far from Tokyo Bay. Ports on the Inland Sea are farther on. They lie on the route to the mainland and are more convenient bases for Asiatic trade.

The Kwantō Plain is relatively fertile and is able to produce about three quarters of the food needed by its inhabitants. About two thirds of the land is cultivated and rice is raised on over 40 per cent of the acreage in use. Drier and well-drained uplands grow about half of Japan's barley. Annual precipitation is about sixty inches and the growing season averages about 200 days. Light snows fall in winter.

Earthquakes still handicap Tokyo. In 1855, two years after Admiral Perry arrived to negotiate the opening of Japan commercially, nearly 7,000 lost their lives in the city. In 1923 Tokyo was half-destroyed. This disaster resulted in considerable modernization. Wide streets now occupy about one quarter of the city's area; each serves to prevent the spread of fire, and did so during the bombings of World War II. No structure may be over 100 feet high and building codes require that all be reasonably earthquake-proof.

Greater Tokyo has an area of 223 square miles, extending widely beyond the 31 of the original city. With a population of well over 7 million it became the world's third largest city before World War II. During the war the population dropped to about 3.3 million. Such reductions are ordinarily temporary, and it may be expected that the 1939 population will be equalled before many

years have elapsed. Though Tokyo is the most European city in the Oriental World, with a subway, modern stores, moving-picture theaters, and most of its men in European dress, it still retains much of Old Japan. Its streets remained generally unnamed prior to World War II and houses were assigned numbers according to dates of erection within districts, rather than in an orderly, geographical way that might assist in such problems as the delivery of mail.

The old Shogun castle became the royal palace when Emperor Meiji made Tokyo his capital in 1868. As political center since the start of Japan's renaissance, Tokyo became headquarters of the Zaihatsu and hence commercial capital of the nation. It also developed into the leading educational center and is chief node in the railroad network.

Tokyo was a city of small factories until the mid-1930's, when it was apparent that the disadvantage of earthquake hazard was outweighed by the advantage of central location. Mills were built with capacities sufficient to produce over 10 per cent of the country's pig iron and steel. Coal arrives by steamer from mines near Sendai and on Hokkaido. Considerable hydroelectric energy has been developed. Nearly 30 per cent of Japan's industry is concentrated in the Kwanto district. Silk, electrical goods, chemicals, machinery, ships, railroad rolling stock and equipment, china ware, celluloid, lacquer wares, toys, and foodstuffs are typical manufactures. As capital and educational center, Tokyo is foremost in printing and similar trades.

Yokohama (951,000) is Tokyo's modern port, with excellent wharves and extensive warehouses. It is chiefly commercial and exports large quantities of silk and tea.

The Nobi Plain, extending inland from Ise Bay, east of Biwa Lake, is separated from both Kinai and Kwanto plains by hills that render communications difficult and expensive. Though *Nagoya* (1.0 million) lies only 140 miles from Osaka and 235 from Tokyo, it has developed quite independently as a commercial center. The plain supports over 5 million people. Excellent tea is grown in the Uji district far to the west, but most of Japan's supply comes from the Shizuoka uplands, between Nagoya and Tokyo. This is the source of most green tea for the United States.

Central Honshu produces about three quarters of the world's silk. Eighty per cent of the silk was exported, of which nearly all went to the United States, prior to World War II.

An original harbor at Yokkaichi was poor, but dredging and other improvements resulted in facilities that permitted the Nagoya district to rise to

fourth place among ports; after Kobe, Yokohama, and Osaka. Nagoya has local supplies of lignite, but depends on Kyushu for coal, which is supplemented by hydroelectric power. Though it ranks first in production of cheap pottery and manufactures considerable porcelain, the city is primarily a textile center. Cotton, silk, and woolen goods comprise 60 per cent of the value of its manufactures. Within recent years it became Japan's leading aircraft manufacturing center. Lesser industries include making tools, machines, metal wares, lacquer wares, and chemicals.

NORTHERN HONSHU

Landscapes characteristic of central Honshu, with rice on flats, tea and mulberries on slopes, and a rather wide diversity in crops gradually lose their subtropical forms northward. Rice grows much farther north than oranges, sweet potatoes, tobacco, mulberries, tea, or bamboo. Little double cropping is possible where summers are likely to be foggy, more than 60 days have killing frosts, and growing seasons are reduced to as few as 160 days. The Japanese adjusted themselves slowly to this northern territory; considerable areas of cultivated land have been in use for less than a century.

Precipitation is excessive in much of northern Japan, 100 inches being typical of mountain slopes toward the Sea of Japan and 80 toward the Pacific. Only deep valleys and other sheltered places are likely to have as little as 40. Excessive snow falls on western slopes, maximum values occurring in about 37° N. Sidewalks of many towns are covered, houses are provided with wide, snow-shedding eaves, and railroads in exposed locations wind through wooden tunnels, snow sheds. This west coast was backward. Much land remained in large estates and was relatively unproductive prior to World War II. Common people found difficulty in making a living. Many turned to the sea; so long fishing villages parallel the coast. Others sought better conditions elsewhere, in Hokkaido or foreign countries. Redistribution of land during the occupation has given a new impetus to agriculture. Population is increasing rapidly.

Rice is raised wherever it will grow successfully, but much of northern Japan is given to Irish potatoes, beans, buckwheat, millet, barley, oats, apples, and cherries. Horses are pastured on open lands unsuited to cropping. Copper, lead, zinc, and silver are mined at various places, especially along the east coast. The Joban district,

near *Sendai* (341,000), produces a fair amount of coal which accounts for a little industrial development both locally and at *Kamaishi*, a bit farther up the coast. Limited amounts of petroleum have been recovered at several places along the west coast, but Japan's resources are insignificant in comparison with needs.

The scenery of Honshu is magnificent and attracts many tourists. Not far from Tokyo, near sacred *Nikko's* many pagodas and shrines, is the *Splendor of the Sun*, a waterfall with an unbroken 350-foot drop. Farther north are mountains rising above 10,000 feet, amply supplied with snow, water, and forest, white in winter but verdant in summer.

NORTHERN ISLANDS

Though Hokkaido belongs to Japan proper it is still in a pioneer stage of development. Most of the surviving *Ainu* live there and the Japanese have had trouble in adjusting themselves to an environment that would permit Norwegians, Swedes, Finns, or Chinese to live in prosperity. The population density is only one sixth that of Honshu. Two million engage in agriculture on land that could readily support twice that number. The total urban population is but 800,000, but could well be over five times as large. An alternate name, *Yezo* (barbarians, i.e. *Ainu*), refers to the fact that the island long remained foreign to the Japanese. Few Japanese settlers arrived before 1880, when people from Honshu began occupying the fertile *Ishikari Plain*, in the mild southwest.

In the coastal lowlands the thermometer rarely descends below 0° F., though in the interior it may drop to -40°. The growing season varies from 90 to 150 days. Snowfall is excessive in many places, but most upland vegetation is *taiga*, rather than *tundra*.

Coniferous forest, which covers more than half of the island, was the source of over half of pre-war Japan's timber and much of its pulp. Mixed forest is widespread in the southwest.

The average farm is well over ten acres in size, rectangular in pattern, and has a log-cabin house and large barn. Many are *stump farms*, in partially completed clearings, crops being planted before all timber is cut or stumps removed. The relative mildness of southwestern climate is indicated by the fact that rice occupies about one quarter of the cultivated land. Though other crops would be more profitable, rice extends just as far as it is possible to harvest one crop per year. Beans, however, rank first, and farming incomes

are supplemented by sugar beets, Irish potatoes, and peppermint. Oats and hay support horse and dairy farms. Cherries, apples, and pears are the main orchard crops.

Hokkaido accounts for about one fifth of Japan's fishing. Its main industries are canning, food processing, and lumbering. A little heavy industry has developed at *Muroran*, where coal and iron are available. *Hakodate*, the principal port, has an excellent harbor.

Karafuto, the portion of the island of Sakhalin south of 50° N., extends to within 30 miles of Hokkaido. It was claimed by Japan in the sixteenth century, though Russia disputed ownership. In 1875 the Japanese withdrew, in exchange for clear title to the Kuril Islands. In 1905 Sakhalin was divided between the two nations, a fact formally acknowledged by Russia in 1915. Japan got the worst of the bargain. *Karafuto* contains some coal, but the Russian part of the island appears to have the largest petroleum reserves outside of the Caspian Basin in Soviet Asia. After World War II the entire island was claimed by the Soviet Union.

Though southern *Karafuto* is no farther north than southernmost England, or southern New Brunswick, snow remains on lowlands until May and the two vegetational assemblages present are *taiga* and *tundra*. Less than 100,000 acres are planted, to oats, fodder, potatoes, and peas. Of 340,000 prewar inhabitants, 330,000 were Japanese, the remainder being mainly *Ainu* and Koreans. Logging is the winter occupation. Spruce and pine are cut for timber, and hardwoods for charcoal. The value of forest products exceeds that of fishing, the summer occupation.

Karafuto has little rural population. Two thirds of the inhabitants live in towns of more than 4,000. *Otomari*, the southern port, and *Toyohara*, center of the agricultural *Suzuya Plain*, are the largest. The main industries center on forest products and fishing. Salmon and crab meat are canned and other fish dried, salted, or subjected to oil extraction and rendering into fertilizer. The coal, along the west coast, has not been exploited sufficiently to account for any local industry.

Soviet Sakhalin was hardly developed prior to World War II. In 1930 its population was supposed to have been only 15,000, yet many tankers left its northern ports with petroleum for about eight months of each year, so many persons believed the population to have been considerably larger.

The Kuril Islands stretch for more than 700 miles from northeastern Hokkaido to Kamchatka, and have a total area of about 4,000 square miles. Though discovered by Martin de Vries in 1634,

the Dutch made no effort to claim them. They are a volcanic chain with thirty-two main islands and peaks rising to 8,000 feet. Hidden in fog as dense as that off Labrador for most of the summer and covered by snow from September to June, these bleak islands have practically no agricultural possibilities. The exception is Kunashiri, which is practically part of Hokkaido, where some beans are raised. Freezing weather begins in December and lasts until March. February, the coldest month, has an average temperature of about 20° F. toward the southern end of the group, and August, the warmest month, is little above 60°. Tundra prevails in all uplands and at sea level toward the north, where no month is as warm as 50°.

Aside from naval and military personnel, the prewar population of the Kurils was about 15,000, consisting of Ainu, Kamchadal, and a few Japanese. The chief occupations are hunting bear, fox, sable, seal, and otter; fishing for salmon, cod, and crab; and mining iron, copper, and sulphur. Hot springs and boiling lakes account for the name, which means "smoky" (Russian: *Kuril*).

URBANIZATION

Japan has six cities of about a million or more: Tokyo, Osaka, Nagoya, Kyoto, Kobe, and Yokohama. These giants manufacture goods for foreign trade and perform commercial and political functions for the islands as a whole. It is notable that few cities of intermediate size exist. Prior to World War II there was none with population between 400,000 and 950,000, only three in the 300,000 class, and nine in the 200,000. These lesser cities serve limited agricultural hinterlands or industrial districts near supplies of coal. The giant cities are those characteristic of a world power. The absence of a reasonable number of smaller cities is an expression of topographic irregularity which has cut Japan into mountain blocks between which small lowlands form insufficient hinterlands for more than large towns.

Urbanization has simulated European patterns. Population growth rates have climbed in a spectacular way, accompanying Japan's intensified Industrial Revolution. At the time of the Japanese renaissance less than one fifth of the population was urban. By 1920 the ratio was one third and by 1940 one half. The number of persons engaged in agriculture remained about constant, but the relative decline in farm population was from about 64 per cent in 1903 to 43 in 1940. During that interval small towns actually lost population, while places of 100,000 or more increased in size. Between 1920 and 1935 the com-

bined increase in large-city population was from 6.7 to nearly 18 million. In spite of war damage, which left some 10 million homeless, it is thought that nearly 21 million now reside in cities of 100,000 or more. There are 110 towns with populations of over 20,000. Two thirds as many people live in urban centers smaller than 100,000 as in those larger than that size.

The major cities have European-like cores and residential districts, but other cities and towns are low, crowded places with unpainted wooden buildings. Many have linear patterns, stringing along coasts or crests of floodplain natural levees. Rectangular plans, suggesting the steppes of Asia rather than Europe or America, developed around many old Daimyo forts and route intersections. Here and there a temple or shrine with an attractive exterior rises above the thatched roofs of plain one-storied houses and stores. Nucleated settlement is the rule, except in Hokkaido, where people are dispersed on individual farms. In most of rural Japan houses are hidden by bamboo or other hedges, or lie behind fences. A tendency to raise structures on stilts is possibly an expression of Malay influence on buildings.

The cultural landscapes of rural Japan are typically Oriental. There are few roads or fences. Narrow lanes and paths wind to fields separated by hedgerows, dikes, or ditches. Almost no mechanized equipment and few teams of animals are to be seen; if animal power is used, a single ox or horse is hitched to the plow. Forests are important in landscapes. Unlike the Chinese, the Japanese are interested in forestry and a large share of the trees now growing have been planted by hand. Original broadleaved forests have been replaced by planted coniferous stands of timber.

POPULATION PRESSURE

After remaining stable at about 30 million for over a century, Japan's population climbed to 60 million between 1840 and 1925, rose to over 73 million by 1940, and is about 84 today. At prewar maximum, the annual increase approached a million, though in 1939-1940 the rate dropped to less than one quarter of that number. By 1948 the increase exceeded a million per year.

Territory south of Hokkaido is rather efficiently utilized, though experts claim that crop yields might be increased by 20 per cent. Practically all aspects of land utilization have been performed with skill and scientific understanding. Human excreta, fish guano, wood ash, rice straw, soybean products, and various types of fish and

chemical fertilizer are used to great advantage in forcing crops to greater yields. People increased faster than food supply, so population pressure became intense and Japan was unable to produce its entire food requirements. Income from manufacturing, shipping, foreign investments, tourists, and other sources helped fill the gap by paying for food imports, but diets of the masses were meager.

It is incorrect to blame population pressure for Japan's becoming a world problem. Japanese have been aggressive in taking the lands of others for many centuries. They asserted claims to northern islands that were useless at the time and embarked on a program of taking Korean and Chinese lands as early as the fourth century, when there was certainly no population pressure at home.

The Ryukyu (Liuchiu) Islands were objects of the first major aggression. These islands belonged to China until Japan conquered the Okinawa Group in 1609. It was not until after 1876 that the acquisition had real meaning. The Liuchiu king was deposed in 1879 and sent to Japan, where he was kept in comfort. Okinawa itself is relatively large and densely populated. Its town of *Naha* has a population of 66,000. Ichuma, a fishing village, is of note as being the first place in the Oriental World to recognize property rights of women. Altogether there are 55 actual islands in the Okinawa Group and many low reefs, the combined land area being nearly 1,000 square miles and the population 600,000. The volcanic Sakishima Group, to the south, is less valuable, but served the Japanese as stepping stones to Formosa, the next main acquisition, from the Chinese War of 1895. Had it not been for European intervention, however, Japan would have kept several footholds on the Chinese mainland.

Since the Russo-Japanese War of 1904-1905, Japan has carried on its aggressions against China by means of shadow-boxing with Russia. Korea, Karafuto, control of southern Manchurian railroads, and a 99-year lease of Kwantung Penin-

sula and the railroad terminus Port Arthur, came directly from the Russo-Japanese War. After provoking many incidents and finding the Soviet Union unwilling to go to war, Japan marched into Manchuria in 1931, establishing its puppet state of Manchukuo soon afterward. This military success was followed by aggression southward, which swept through most of eastern China.

Japan played almost no part in World War I, though it became one of the Allied Powers and reaped huge profits supplying materials. It came out of the war with an extensive mandate over former German islands in the Pacific. The good fortune attending Japan's modern war experiences undoubtedly played an important part in promoting aggressive plans. A military clique established at Kwantung gained control of the government and made preparations for World War II.

Population pressure has not been reduced appreciably either by Japanese aggression or by emigration to other countries. Though attractive subsidies were offered colonists, only about 200,000 went to Formosa to become agriculturists. Emigration to Hokkaido failed to attract many and its rate actually declined in the late 1930's, even though a much higher standard of living awaited most settlers. There are about 135,000 Japanese in the United States and 130,000 in Hawaii. Though Brazil offered many inducements and permitted free immigration, the total Japanese population there numbers only about 200,000, which is less than one fifth of the annual population increase during some years at home. Less than 90,000 Japanese settled as colonists in China and less than 22,000 in either the Philippines or Peru. Some 650,000 went to Manchuria, but most of them as rulers, businessmen, and exploiters rather than as farmers.

Many reasons have been advanced as to why so few Japanese have gone into conquered lands or other places where they can emigrate freely. The most probable is simply that they prefer to remain at home. Shinto and other influences have instilled in them a love of fatherland such as has developed in few people.

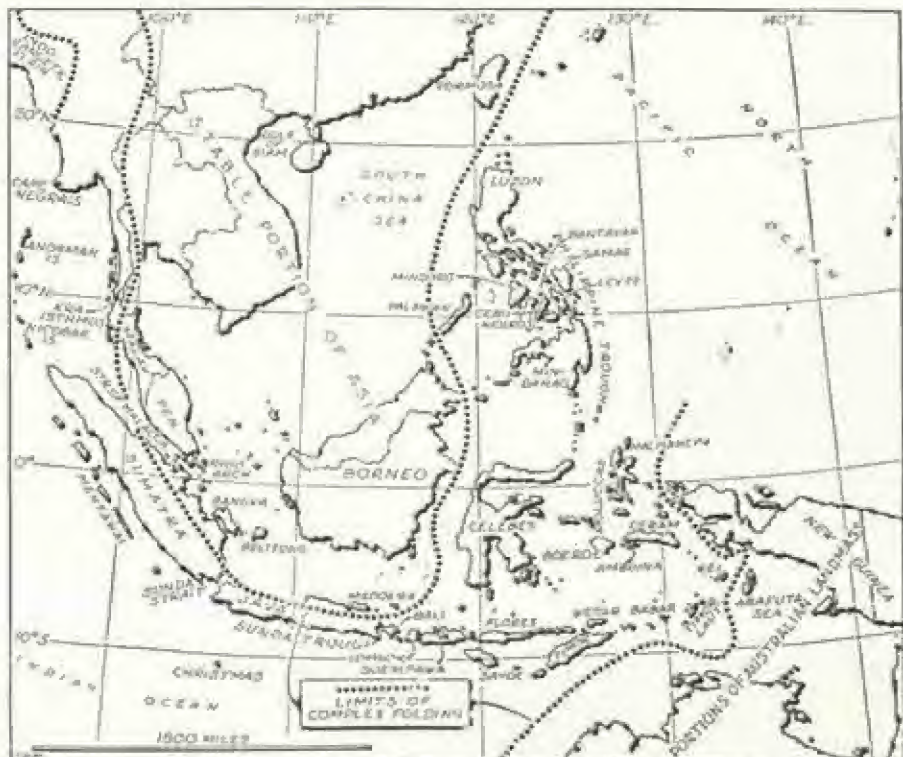
46: Malayan Realm

Less Caucasoid than the Indian and less Mongoloid than the Chinese is the Malayan Realm of the Oriental World, a region of islands approximating Indonesia, or the East Indies. Included is a small part of the mainland of Asia: the Malay Peninsula south of Kra Isthmus, in about 10° N. Included are the Philippines, but excluded is huge New Guinea, which lies in the Pacific World.

The central part of the realm is geologically a stable region, a partially submerged plateau that extends from the Malay Peninsula and Indo-China across shallow seas to narrow strips of eastern Sumatra and northern Java and into Celebes. In an arcuate pattern beyond this quiescent core is one of the world's most complicated folded regions, where earthquakes are frequent and many volcanoes are active. An outer arc swings from Cape Negrais, west of the Irrawaddy Delta, through the Andaman and Nicobar islands, along

the Mentawai and other Outer Sunda Islands, to the Arufura Sea, where it curves northward into westernmost New Guinea. Other fold trends lie concentrically within, along the mountains of western Sumatra, southern Java, and the Lesser Sunda Islands to Ceram Boeroe. Related arcs project northward into the Philippines. On the convex fronts of the arcs are some of the world's great ocean deeps. The Sunda Trough lies in the Indian Ocean, south of Sumatra, Java, and Soembawa. The Philippine Trough, of the North Pacific Ocean, includes the Mindanao Deep, over 35,400 feet, and lies not many miles east of the islands.

The Malayan Realm centers on the equator, reaching beyond 10° S. near Timor and almost to 20° N. just north of Luzon. Large Sumatra and Borneo are almost bisected by the equator. Java and the Lesser Sunda Islands are in the Southern Hemisphere.



Malayan Realm:
geological relation
ships

Seasons are poorly defined in the southern part of the realm, where rain falls at all seasons and lowland temperatures seldom depart from 80° F. Significantly cooler weather occurs at higher levels, but without seasons. Islands close to the Asiatic land mass experience rather mildly the effects of monsoon winds, the least-wet months occurring while wind blows away from the mainland. Tropical rain forest is the natural vegetational cover of most lowlands. Open forests and grasslands have developed in drier locations, most of which lie in the lee of mountains, where rain-shadow conditions exist.

The Malays are a mixed stock, predominantly Mongoloid, but with some Archaic Caucasoid physical traits and evidences of a Negroid strain. The realm was originally inhabited by Negritos, members of a group that once extended from Africa across southern Arabia and India to the Pacific. A considerable number of typical Negrito people survives in the islands between Cape Negrais and Sumatra and in the Philippines. A few others occupy smaller islands around Borneo. Others live in New Guinea and Melanesia, beyond the realm. Archaic Caucasoids who resembled the Bushmen of Australia arrived later. Their stock survives among many widely scattered primitives, most of whom live in remote uplands. Mongoloids were the last invaders to become thoroughly entrenched. Earlier Malays had fair skins, full lips, flattened or stubby noses, and small bodies. Later Malays are similar, but more decidedly Mongoloid. Some in the Philippines exhibit many Chinese characteristics.

The culture hearth of the Malay extends from Sumatra to Soemba. Here he evolved as an aristocratic, good-natured little Mongoloid who is an excellent seafarer, pirate, fisherman, and trader. He cultivates land because the chore is unavoidable. As a plantation hand he is ordinarily unreliable. In a position of some authority he may become extremely faithful. He is instinctively polite and, according to European appraisal, occasionally capable.

Malays now dominate coasts eastward into Flores and other islands as far as Timor, but various primitives occupy the interiors. Some Malay seamen found their ways westward as far as Madagascar and others northward to Japan, settling wherever they went and becoming significant strains in surviving populations. The realm has served as an earlier home of populations that spread eastward into Pacific islands, even those most remote. The Melanesian, Micronesian, and Polynesian all trace their migrations back to the

islands of southeastern Asia, where they acquired their languages and basic culture traits.

The relationships between various Malay and Pacific island languages are shown in the following table:

Table 27 Malayo-Polynesian languages of the Austronesian family

MALAY

Malayo-Javanese

Malay (Achinese, Battak, Bugi, Dyak, Makassar, Lampong, Malay, Nicobarese, Rejang) of Malay Peninsula, Sumatra, Java, etc.

Javanese (Javanese, Madurese, Sudanese, Balinese, Sassak) of Java and nearby islands.

Tagala

Tagala (Tagalog, Batan, Bicol, Ibanag, Ilocano, Pampango, Pangasinan, Tino, Visayan, Moro or Sulu, Manobo, Montes) of the Philippines.

Formosan (Formosan) of Formosa.

Malagasy (Malagasy) of Madagascar.

Cham-Selung (Cham or Tiam, Selung) of Cambodia, Malay Peninsula, and Mergui Archipelago.

POLYNESIAN

Samoan or *Mahori* (Hawaiian, Tuamotu, Tahitian, Marquesan, Maori, Samoan, Tokelau, Ellice, Cook, Austral, Tongan, Niue) of Polynesia.

MELANESIAN

Tarapon or *Micronesian* (Cataline, Gilbertese, Ladrone, Marshall) of Micronesia.

Tifian or *Melanesian* (Fiji, Banks, New Caledonian, Loyalty, New Guinea, New Hebrides, Solomon) of Melanesia.

The Malayo-Polynesian group contains far more languages than are shown in the table, about 250 in all. On the whole they are easy to learn because they are simple structurally and have small vocabularies, but Javanese and a few others are highly cultivated tongues. The so-called Low Malay, or Trade Malay, so readily learned by anyone and in use by a good many Europeans who reside in the East, is nothing more than a pidgin language which is widely understood in the East Indies and Pacific islands.

The most widely adopted religion in the Malayan Realm is Mohammedanism, which was introduced by Arab traders at a fairly early date and enforced by conquests of the thirteenth and fourteenth centuries. Arabs, on the whole, are the wealthy class and occupy a place of high esteem in the East Indies. Moslem populations turn to them for spiritual and intellectual leadership. In times of prosperity as many as 50,000 Javanese per year have made the pilgrimage to Mecca. Hinduism dates from the sixth century, when Indians conquered Java, and Buddhism from the eighth century. Both have only minor followings

today. There are some 2.5 million Christians in Java and four fifths of the Filipinos are Roman Catholic. Paganism is widespread among tribes in the interiors of larger islands. Most pagans adopt Christianity when converted to some leading religion.

Most Malays depended on subsistence agriculture until Europeans introduced modern farming. The earlier objective was to provide food for the traditional two meals per day, one before and the other after the period of greatest heat. Modern farming is designed primarily to grow surpluses for trade.

The primitive digging stick is still employed to raise upland rice, which is unirrigated. On lowlands wooden plows are dragged by water buffaloes across irrigated rice fields. In the interiors *fire cultivators* still carry on a shifting agriculture in which plots are burned to leave wood ash on the surface, a fertilizer sufficient to raise three crops or so before activities are moved to a new site. The surplus of food and other agricultural products exported from the East Indies comes from none of these; it is the result of modern plantation agriculture, in which most of the workers are Chinese or Indians, or possibly Malays who have adapted themselves to the European system.

Malaya has been exploited by Arabs, Chinese, and Europeans. No native group has been thoroughly independent and it remains to be seen whether political freedom granted to the Filipinos and a considerable degree of independence in the Netherlands East Indies will prove permanent. Some 90,000 Arabs comprise one of the wealthy ethnic groups in Java and nearby islands. The Chinese have taken over most of the business in many parts of the Malayan Realm. Europeans have made vast fortunes out of East Indian products, but the average European resident is an industrious worker who devotes a great deal of energy to developing plantations, promoting commerce, or carrying out governmental obligations. The few people who occupy the apex of the economic and social pyramid are native princes and other royalty who have been particularly well treated in return for their influence. The Sultan of Sulu, for example, was the only royal ruler ever permitted to operate under the protection of the American flag. Other sultans, rajas, and the like have prospered under the Dutch and British.

In 1946 the United States voluntarily gave up its richest colony, the Philippines, establishing a precedent that may mark the start of a new era in relationships between European World and other peoples. The Netherlands East Indies was a colony until 1932, when it was incorporated

into the home country, just as France absorbed Algeria. More recently the Dutch have recognized a Republic of Indonesia, which consists of Sumatra, Java, and Madoera. This has become a truly independent unit, but the Dutch hope to salvage commercial control in exchange for its recognition and by no means have released their paternal interest. Independence came in several steps between 1945 and 1952. Borneo and the "Great East," the less advanced islands east of Java, became part of the republic, but the Dutch retain a portion of the island of New Guinea. Indonesia was admitted to the United Nations in 1950. Whatever the political fortunes of Malayan territories may be, the important economic fact is that the Chinese are rapidly becoming masters of the islands. Some 1.25 million were in Dutch parts of the realm before World War II and there are considerably more today. They already control most of the business and carrying trade of the Philippines and islands to their south.

Centers of European interest have shifted enormously since the start of the sixteenth century. The Moluccas, or Spice Islands, were among the primary objectives of the Voyages of Discovery. The cost of Magellan's trip was more than paid for by cloves and other spices brought to Europe by the single surviving ship.

Magellan reached the Philippines in 1521 and Spain took possession within five years. Native Filipinos were carrying on an active trade with China, so it was not difficult to find cargoes for Spanish ships. Galleon fleets used Pacific waters, rather than routes disputed by Portugal. Their course was from Philippine Manila to Mexican Acapulco. Goods were carried overland to Veracruz, thence across Spanish waters to Europe.

Both Portuguese and Spanish entered into trade with the Moluccas. Tidore carried on a lively trade with the Spanish, while nearby Ternate served the Portuguese. The latter have left many mixed-race descendants in the Great East; people who are essentially Mongoloid, but who retain Portuguese names and family traditions.

The Dutch were comparatively late in arriving on the scene, in the middle part of the seventeenth century, but they were wise enough to concentrate activities in places that were culturally advanced, through Indian and other contacts, and where Arabs had established trading habits among the natives. Though the British possessed Java for a short time, the Dutch East India Company kept control over the best islands of the East Indies until 1798, when actual rule was assumed by the Crown. By 1816 all of Java was firmly in Dutch

hands. It then had a population of 5 million, not much over one tenth that at present. Eventually the Dutch consolidated their holdings into an empire extending across a length of 3,100 miles and comprising an area of 735,000 square miles, the largest group of islands on earth.

Of Portuguese possessions, only the eastern half of Timor remains. Spain lost its vestige of political control in 1898 when the Philippines were taken by the United States. The British retain about one quarter of Borneo and a number of small islands. They are in control of the mainland part of the Malayan Realm.

The Islands of the East Indies ordinarily supply the world with 90 per cent of its quinine, 85 of pepper, 80 of cocaine, 65 of kapok, about one third each of rubber and sisal, one quarter each of copra and palm oil, one fifth of tea, one sixth of tin, one twentieth of coffee, and one fortieth of petroleum. It is estimated that about 3 per cent of the world's petroleum is in the East Indies; this is more than in any other place between Iran and North America. The islands contain almost totally unexploited reserves of hardwood, iron, gold, and other minerals. Though the production is not large, the tobacco of Sumatra is in particular demand for cigar wrappers. In order of value, the five leading exports are rubber, petroleum, sugar, tin, and tea. Though Java has more than half of the population, the value of its exports is not quite equal to that of the other islands combined. Borneo's petroleum tips the balance away from Java. Java accounts for about two thirds of the imports.

There are astounding differences among population densities of various islands in the East Indies. Java and Madoera have 52.0 million inhabitants in an area of little more than 51,000 square miles, a density of over 1,000 per square mile. Other Indonesian islands combined have 22.1 million on more than 702,000 square miles, a density of about 30. In the Philippines, the island of Cebu has a density of 630, but Mindanao has less than 50. Many islands in the Malayan Realm are very sparsely inhabited; Ternate and Amboina have densities of about 5 per square mile. In Timor, Celebes, and Sumatra the values range from about 50 to 80.

JAVA

With an area of 51,000 square miles (about that of Alabama), Java is the smallest of the Greater Sunda Islands (Celebes, 73,000; Sumatra, 164,000; Borneo, 282,000; New Guinea, 342,000).

Its population increased from fewer than 5 million to over 28 during the nineteenth century, and to an astonishing 52 million today. Its size and population are about those of England.

A Hindu kingdom in eastern Java dated from the sixth century and did much to raise the cultural level of the Javanese and Madurese above that of other Malays. Arab contacts developed considerable commerce. Mohammedan conquest resulted in destroying most of the Hindu temples and in widespread conversion to Islam. The Dutch began by making an alliance with a Sundanese Sultan in western Java, which led eventually to control of the entire island.

Dutch colonial policy is commonly thought to be the most enlightened in the world. It has resulted in a happier and economically more satisfactory lot for the natives than have the policies of most other nations. No European or alien is permitted to own land which is used by natives, so tenancy is practically nonexistent. Half-castes are considered as "white." Of 250,000 "Europeans" in Java, probably two thirds are mixed-bloods. A strict ban again the use of Portuguese and a determined effort to educate the upper classes in Dutch firmly established the latter as the first official language. A possible blunder was committed in recognizing Malay as the second official tongue; six times as many people speak Javanese as Malay. Local governing bodies were left undisturbed wherever possible. Villages are generally under communal control, with people electing their chiefs or other officials. Possibly such policies account for the fact that Java, with its extensive plantations and large surpluses for export, actually produces its own food. The enlightened colonial management, however, did little to foster any true love for the Dutch. The native population thoroughly resented European control.

In several ways Java is favored among East Indian islands. It has extensive areas of fertile soil, most of which has been derived from iron-rich lava or volcanic ash. It has less swamp and broader areas of healthful territory than the other large islands. There is enough monsoon effect to bring a dry season, and considerable topographic irregularity results in a variety of climates. Rainfall exceeds 300 inches in parts of southern Java, but on most lowlands the range is from 60 to 100, and in the northeast the annual precipitation is but 40. Original natural vegetation varied from tropical rain forest, in the west and south, to open forests and grasslands northeastward. Teak, giant figs, bamboo, and tropical vegetation generally have been cleared to an elevation of 4,000 feet, except on very steep slopes.

Nearly half the area of Java is cultivated, two

thirds of which is planted to rice or maize. Nearly half of the tilled land is irrigated, producing two rice crops and one additional crop each year. Where rainfall exceeds 60 inches, rice is both planted and harvested during every month of the year. Maize is the main cereal crop of porous or drier soils. Peanuts and soybeans are other important food crops.

Eighty-five peaks rise above 6,000 feet, the highest to over 12,000. Of over 100 volcanoes, about half have been active during historic time. Tambora, on Soembawa, exploded violently in 1815 in an eruption about as spectacular as that of Krakatao, in Sunda Strait, in 1883 when some 36,000 were killed by the resulting sea-wave. Nearby Anak, formed in 1927, was 400 feet high in 1942. The prospect of being blown to eternity rarely prevents farmers from taking advantage of fertile volcanic soils. They ascend slopes and spill over into favorable craters to reap rich harvests, and rightly, because violent explosions are extremely rare, and the prospects of attaining ripe old age are not reduced appreciably by residence on even a fairly active volcano.

The most extensive and productive lowlands lie to the north of Java's volcanic backbone. South slopes are least favorable for development. They are excessively wet and the coast is fringed by coral reefs. Waters are shoal and treacherous, so few harbors exist. Towns are small, and rural areas are sparsely inhabited.

Though Java exports a little teak to Europe and other hardwoods to Australia, China, and Japan, there is little value left in the forests. A slight amount of fire cultivation exists in remote areas, among primitive tribes, but 95 per cent of the island's useful land is regularly farmed. About 30 per cent of tilled land is in plantations.

Cinchona grows in western Java, the optimum elevation being 5,000 feet. Until the nineteenth century the world depended on diminishing supplies from Peruvian forests for its quinine. The British managed to get South American cinchona established in India, and the Dutch took it to Java, where they developed its culture into a world monopoly. Other upland plantations grow tea, coffee, vegetables, and flowers. Rubber and tobacco are raised at intermediate elevations.

Sugar cane is the plantation crop of northern lowlands, where cheap water transportation is available. It is the custom to replant cane every third year, though it will produce as long as twenty after a single planting. Diminishing returns render it uneconomic to harvest too many crops per planting. This world's most prolific grass will be found increasingly useful for supplying

products other than sugar. No other form of vegetation produces as much energy per acre each year.

Coconuts, various palms, and kapok are other wet-area plantation crops. The kapok tree grows blossoms with silky fibers that support thirty times their weight in water. Kapok is useful not only for life preservers but also for stuffing mattresses and pillows. The seeds furnish oil for soap, and the pressed waste is used as cattle food. Two important starch crops of lowlands are sago palm, for sago, and cassava, a root stock, for tapioca. Sisal and peanuts are plantation crops in drier locations.

Plantation crops are everywhere subject to world prices, and hence bring either riches or poverty to producers for reasons entirely beyond their control and beyond the comprehension of the laborers. Sugar cane has been in over-supply repeatedly. During the depression of the 1930's it brought little return for the reason that the Dutch florin became dear in terms of pounds or dollars. Rubber from British Malaya and other places glutted the world market, so that prices fell lower than production costs. This brought an agreement between British and Dutch interests that established quotas and kept prices high for several years before World War II. It is possible that the huge synthetic rubber plants in the United States will end the rubber monopoly of Malayan powers. A British and Dutch agreement concerning tea production and prices is rather ineffective because China and Japan refused to cooperate. Synthetic substitutes may end Formosa's camphor monopoly. The world, however, will probably depend on Java for quinine for many years to come.

Java's main domestic animals, the water buffalo in wetter places and oxen in drier, are raised for work, not meat. For protein the island depends on fish, both from the sea and ponds. Fish farming is a secondary occupation in the paddy fields of the north.

Petroleum occurs near Rembang, on the north coast to the west of Madoera, and natural gas west of Soerabaja (Surabaya). Both sulphur and manganese are mined extensively, rich deposits of the latter lying to the southeast of Batavia.

About two thirds of all East Indian industry is concerned with making products by hand, for local needs. Only one third involves factories with power, and consists chiefly of agricultural processing: sugar refining, preparing quinine or tobacco, turning out leather goods, and the like. Cement, brick, tile, small metal wares, furniture, plaited

goods, soap, ice, paint, and paper are manufactured. Though the hydroelectric potential is great, only a small fraction has been utilized.

Communications have been well developed. Excellent roads and railroads connect all principal places. A rather important tourist trade was established before World War II. Both sea and air communications with Europe were excellent. Java offers the advantage of bracing highland climate; interesting scenes; exotic vegetation, such as tree ferns on uplands; the possibility of viewing active volcanoes; contacts with intelligent natives having batiks and other things for sale; a variety of distinctive oriental cultures; and comfortable accommodations.

Jakarta, formerly *Batavia*, 1.2 million, has less than 9 per cent European population. Founded in 1619, it has been the main center of Dutch influence, and became capital of the empire for a short time during World War II, when the Netherlands was invaded by Germany. The temperature is uniformly high, always near 80° F., and the rainfall heavy, 72 inches. Buitenzorg, in the foothills not far distant, with a much better climate, is a secondary business and residential center. It has a larger European population in spite of more than 200 thunder-days per year. The resort of Gede, at an elevation of nearly

10,000 feet, offers a climate with uniform temperature below 50° (tropical alpine tundra).

Bandoeng, inland and at an elevation of 2,400 feet, with a temperature of 71°, is a commercial center of more than 750,000, and headquarters for stimulating such native crafts as weaving, plaiting, dyeing, tanning, umbrella making, furniture manufacturing, zinc and tin work, and the making of soap, tobacco products, and clay wares. It is notable for its batiks.

Soerabaja (800,000) is the modern port of eastern Java, the main exporter of sugar, and center of the petroleum industry. Its population is almost 10 per cent European. Semarang, in the north-central part of the island, and Surakarta and Djokjakarta in the interior are commercial centers with populations in excess of 200,000. The latter served as capital for native forces resisting Dutch control in 1947.

Though the population is predominantly Malay, fewer than half of the people are Javanese. These occupy the central part of the island. Together with the Sudanese of the west and Madurese of the east, they are a quiet, peaceful people who ordinarily offer little resistance to European or other encroachments. Arab and European populations increase only slowly, but the Chinese are making notable gains, there being more than 1.2 million at present. A large proportion of the shops is now in their hands and they are making rapid



Malayan Realm:
Index map

progress toward commercial dominance. These Chinese are not coolies; like many in other parts of the Malayan Realm, they are the businessmen and entrepreneurs.

THE GREAT EAST

The Lesser Sunda Islands, which extend east from Bali to Timor, are volcanic. Bali's Mt. Agung rises nearly 10,500 feet, and Soembawa's Tambora rose to 13,000 before 1815. Climates grow progressively drier eastward, as they more and more come under the influence of air that has been over the dry heart of Australia. Bali is wet and naturally forested, but barren steppe covers much of Wetar, just north of Timor.

An outer rim of old-rock, chiefly limestone, islands flanks the main Lesser Sundas. It runs from Soemba through Savoe, Timor, and Babar to Timor Laut, then swings in an almost circular arc through the Kei Islands and Ceram to Boeroe. Halmahera (Jilolo), the Moluccas (Spice Islands), New Guinea, and islands to the east are detached fragments of the Australian continent. They include rocks of various ages, some of the very old ones bearing rich ores. As compared with the

Lesser Sundas and nearby islands, the Australian region is stable geologically. It has exhibited little crustal unrest during recent geological time. This stability resembles that of the detached parts of Asia in the core of the Malayan Realm, from Celebes to the Malay Peninsula.

Soils are relatively infertile in less-volcanic islands. Where old rocks have undergone intense weathering under wet-tropical conditions, the soils above them ordinarily exhibit extreme leaching, so that few plant nutrients remain in the insoluble residue. Where such processes have neared completion, the soil is called *laterite*. Many lateritic types of soil occur in Celebes, Borneo, northern Java, and eastern Sumatra.

Bali and Lombok are fertile, and densely inhabited (over 500 per square mile) by people whose cultural attainments resemble those of the nearby Javanese. Bali is a particularly favorable place to examine Malayan and Hindu culture forms. *Flores* and nearby islands are less advanced. On them live the komodo, a giant lizard, ten feet in length, weighing as much as 300 pounds, that awaited discovery by scientists until



Paddy fields: Bali (American Geographical Society)

1911. Even more primitive islands lie to the east. *Ceram* has petroleum deposits. *Halmahera* was the native habitat of clove trees, and like nearby islands is a source of nutmeg, mace, and other spices. Fewer than 600,000 people live in the Moluccas.

The western part of New Guinea is part of the Netherlands East Indies politically, but culturally belongs to the Pacific World. The islands to its immediate west are culturally transition territory, with mixed populations. On many, Malay cultures occur along coasts, while primitives of the interior are Melanesians of the Pacific World.

Celebes, a peculiar spider-like island larger than North Dakota, consists of several rather narrow mountain-chain peninsulas which radiate from a central hub. Its volcanoes are now extinct, but some of the cones rise about 10,000 feet. Old rocks in the north contain valuable deposits of nickel, gold, and silver. A rich native fauna of unique animals contains an ape, dwarf buffalo adapted to life in the forest, and the small cuscus, a pouch-bearer (marsupial) related to the dominant native animals of Australia. Rainfall is excessive in most places, but a dry season between April and October causes trees to shed leaves in the southwestern part of the island. There is little economic development. The chief money crops are coffee and nutmeg, both of which are raised in the north. The population includes 5 million Indonesians, 50,000 Chinese, and 5,000 Europeans. Toradjas, wild Malays of the interior, practice head hunting and have few outside contacts. Makassar-speakers to the west and Bugi-speakers to the north are more advanced. The coastal inhabitants and town dwellers are mainly Mohammedan, though toward the north there are many Christians. The island was a Dutch protectorate under the rule of native rajas who had European "residents" to advise them.

Borneo is considerably larger than Texas. All but 66,000 of its 280,000 square miles were in Dutch hands. The smaller share includes large Sarawak, tiny Brunei, and intermediate British North Borneo, all of which are British politically. The mountain arrangement is something like that of *Celebes*, but lowlands extend from range to range, like webbing of a duck's foot. Mt. Kinibalu in the extreme north is the culminating peak, 13,451 feet. Petroleum is exploited in the north and along the east coast. Balikpapan and Tarakan are the richest fields thus far found in the Netherlands East Indies. Some rather poor coal has been mined in the southeast. Annual rainfall com-

monly exceeds 100 inches and the natural vegetation is predominantly tropical rain forest. Rubber is the leading plantation crop, though there is some export of sugar, copra, and other tropical products. A rich native fauna includes such large animals as elephants, rhinoceroses, bears, and wild oxen. Leeches, rather than wild men, are the bane of man.

The population of Borneo includes 3.0 million Indonesians, 300,000 Chinese, and 6,000 Europeans. The aboriginal population was Negrito. For some unaccountable reason the group apparently failed to reach nearby Celebes, though they went much farther in several other directions. They still inhabit a number of small islands off the Borneo coast. Early Malays came as invaders and now are primitives of the interior. They are sharp-featured, large-boned, tall, heavy Caucasoids who speak Dyak and practice head hunting. They prove docile enough after overcoming fear of Europeans. More advanced Later Malays live along the coasts. They are predominantly Mohammedans. Chinese appeared in the seventh century as traders. They now monopolize business and local carrying trade.

WESTERN MALAYA

Sumatra is much larger than Java and almost twice as long, exceeding California's area considerably and having a length of over 1,100 miles. Its maximum width is over 250 miles, about twice that of Java. In almost all other respects, however, it is inferior to its eastern neighbor. It is relatively undeveloped and has a population of only about 10 million.

A volcanic chain rises high above a foundation of older rocks along the southwestern side of the island. Several peaks project above 10,000 feet. Limited resources of metal ores occur in the older rocks, but the chief mineral exploitation thus far has been concerned with coal along the west coast and petroleum near Medan in the northeast, Palembang and Djambi in the southeast, and Padang on the central west coast.

Agricultural development has been retarded by the presence of extensive areas of lateritic soil on older rocks and by broad swamps north of the mountains. Rubber is the leading plantation crop at elevations of less than 300 feet, the center of production being Medan. Tobacco is grown in the same general region. Limited amounts of cinchona, coffee, and pepper are other plantation crops. Most of the modern agriculture is the product of British capital and Chinese labor.

Extensive rain forests and other types of tropical vegetation remain hardly touched. A highly

diversified fauna includes elephants, rhinoceroses, tapirs, wild pigs, many kinds of deer, tigers, and monkeys. Fruit-eating orangutans nest in forests and gibbons playfully leap from branch to branch. The crocodile along the coastal streams is vicious, but the powerful python of the interior is rarely dangerous.

Kubus are primitives of the interior. Somewhat higher on the scale of cultural development are Achinese-speaking Malays of the northwest. Battak-speakers are comparatively pure Malays along the Straits of Malacca. The most advanced people are the Sundanese of the southeast. Most cultural relationships are close to those of the Malay Peninsula, which lies only fifty miles away, across tranquil waters.

The port of Belawan-Deli serves Medan and the plantation area of the north, where there is considerable railroad development. In the distant east is a detached railroad network connecting Palembang, on the Musi River, with Telokbetong, a port on Sunda Strait.

The islands of *Bangka* and *Billiton* (Billiton), off the coast of Sumatra nearest Borneo and at the northwestern corner of the Java Sea, supply about one third of Asia's tin. *Bintan* (Bintang), in the Rhio Archipelago, east of central Sumatra and just south of Singapore, supplies one sixth of the world's bauxite. This aluminum ore is also mined on the outer islands along the southwest coast of Sumatra. The natives of the *Mentawai* and nearby islands are not Malays, but speakers of more primitive Indonesian tongues. Tiny *Christmas Island*, to the south of Sunda Trough, is a British outpost under the government of Straits Settlements.

The *Nicobar Islands* to the northwest of Sumatra have been administered by the British as part of India. Fewer than 10,000 Nicobarese-speaking Malays occupy their undeveloped 625-square-mile surface. Seventy-five miles to the north along the arc between Sumatra and Cape Negrais are the *Andaman Islands*, a group of over 200 bits of land with a combined area of about 2,500 square miles. These are also in British hands. In their extensive forests are some of the world's most primitive Negritos. Like their Pygmy relatives in equatorial Africa, these people are experts with the spear and arrow. Some 20,000 Indonesians live along the coasts.

The *Malay Peninsula* barely escapes being an island. Its tenuous connection with the mainland of Asia, the Kra Isthmus, is the northern limit of the Malayan Realm. Political and cultural boundaries fail to coincide. Siam (Thailand) projects down the land neck well into Malay territory.

A central core of granite and other old rocks

is flanked on either side by ranges composed of limestone and younger sedimentary deposits. Most of the interior is rough territory, where many peaks attain elevations of about 7,000 feet. The higher mountains lie toward the west. Limited coal reserves along the west coast supply the needs of local railroads. Excellent iron ore to the south, bauxite toward Singapore, and manganese to the north have been developed by the Japanese, for export to the homeland. Tungsten ore is mined near Kuala Lumpur, in the southwest. The greatest metal resource of all, however, is tin.

The earth's richest tin district extends northward for about 1,200 miles along an arc from Belitong through the Malay Peninsula to western Siam. Chinese began working Malayan tin as early as the fifteenth century and they constitute about 80 per cent of the miners today. Most of the tin ore is found in gravels along streams leading to the west coast. The original method of mining, panning, accounts for only about 5 per cent of the production today. Dredges and hydraulic mining yield most of the ore, the main workings being about 100 miles southeast of Penang. It is thought that future reserves exist in lodes of uplands farther east.

The Malay Peninsula supplied about half of the world's tin until 1910. Competition from Bolivia, Belgian Congo, Nigeria, and other sources has now cut the ratio to about one third. Overproduction dropped prices below costs of recovery until the British reached an agreement with other producing countries to establish quotas and high prices. Most of the Malay ore is refined in Penang and Singapore.

The peninsula has a hot and wet climate. In few places does any month of the year receive less than 6 inches of rain, or an annual total under 60. The season from May to September is wettest, due to a monsoon effect least pronounced in the south. Slopes toward the west coast receive about 100 inches and those toward the east 150. In uplands the value rises to 300 or so. Rain falls on 200 days of the average year at Singapore, accentuating a hothouse climate where the coolest part of the day rarely goes below 70° F. and the warmest normally rises to 88°.

Tropical rain forest is too dense for aboriginal populations in many localities. Tigers and monkeys abound in forests, which cover 70 per cent of the peninsula. The west coast is barricaded by mangrove swamps, but clean-sand beaches face the South China Sea.

Of a total population of about 5.8 million, 47 per cent are Chinese, 42 Malays, and 14 Indian.

The Chinese are increasing more rapidly than the Malays and eventually should crowd out all other peoples. They are miners, foresters, plantation owners, and city dwellers. As proprietors they own most of the business establishments, produce over a third of the tin, over half of the rubber, and they also constitute nearly four fifths of the industrial population. Most of them have come from southern China and speak Cantonese. The Indians are mainly Tamil-speakers from Madras, but some have come from the Ganges Valley, and the police are recruited from Punjab.

More-or-less-Caucasoid aborigines now reside in the more open forests. They constitute less than one per cent of the total population. Among them are Cham-Selung speakers, who are organized as tribes. Many are expert in shooting poisoned darts from blowguns with lengths of up to eight feet. They live on fruits, roots, berries, tortoises, and fish. These and similar primitives were invaded by Early Malays and Later Malays from Sumatra. Only during recent centuries have outsiders appeared from across the stormy South China Sea or the Bay of Bengal.

Most of the Malays live along the west coast, where paddy fields supply their main item of diet, rice. The east coast is thinly populated. Though outnumbered by Chinese, the Malays have given the peninsula its second official language. English is the first. About one per cent of the population is European. Prior to World War II, Europeans outnumbered Japanese.

About 15 per cent of the land is cultivated and rice is the main food crop, but the peninsula is unable to feed itself. It is primarily territory of plantation agriculture and, unlike Java, imports about two thirds of its food, to feed plantation hands and miners.

Rubber is the leading plantation crop. Seeds smuggled from Brazil and raised near London became the parent stock for rubber, which the British introduced into Malaya in 1877. By 1900 the output amounted to only four tons, but in some years prior to World War II it was about half a million, and over half of the world's supply. Two thirds of the agricultural land, and over one eighth of the entire peninsula, was planted to rubber. The trees thrive where the rainfall is in excess of eighty inches and there is no dry season. Most plantations lie below 1,000 feet, where the temperature is highest.

It takes about five years for a rubber tree to produce latex in economic quantities. The latex is treated with acetic acid, which is obtained from the blossoms of coconut palms. It is curdled,

dried, and pressed into sheets. The amount of latex cannot be regulated easily once the trees have been planted. Owners of rubber plantations face the same economic difficulties as owners of fruit or nut orchards, or any other tree crops where several years of waiting separate planting from the initial harvest of commercial proportions. High prices encourage over-planting, not only locally but everywhere. High rubber prices resulted in a glut in the world market, because Malaya, Java, and other tropical lands were in overproduction a few years later. This led to an agreement whereby the British and Dutch established quotas so that Java and the Malay Peninsula divided evenly 83 per cent of the world's rubber export. Ceylon, North Borneo, Sarawak, Siam, India, and Burma were allotted the remaining 17 per cent. The largest customer, the United States, found its stocks low at the start of World War II and fearful of similar squeezes in the future is likely to maintain its large synthetic potential. This threat should deny unwarranted profits in natural rubber and hence insure more reasonable prices than obtained while the British-Dutch monopoly was in effect.

Most plantations lie on the west coast to the south of 4° N. Next to rubber in yield are palm plantations for oil and copra, occupying about 12 per cent of all cultivated land. Pineapples are raised between immature rubber trees and on plantations farther south. The output ranks second only to Hawaii. Some coffee and tea are raised on uplands.

Though wholly in British hands, the political organization of the Malay Peninsula is complex. Five "native states," two in the northwest, two in the northeast, and the important state of Johore in the extreme south, are governed through local sultans by British advisers who act as agents of the governor of Straits Settlements. Johore has been a British protectorate since 1885; the other native states were part of Siam until 1909. In the interior are the Federated Malay States of Perak, Selangor, Negri, Sembilan, and Pahang, governed through local rajas by British high commissioners. Straits Settlements has been a British Crown Colony since 1867. Penang, where the British East India Company established a depot in 1786; Malacca, founded by the Portuguese in 1511, lost to the Dutch in 1641, and taken by the British in 1824; and several other outlying places are parts of Straits Settlements.

Singapore (1 million), capital of Straits Settlements, is one of the world's most strategic "south tips." It has been a British possession since 1819, when Sir Stamford Raffles bought it for \$30,000. About four fifths of the population was Chinese,

9 per cent Indian, 9 Malay, 1.5 European, and 0.5 Japanese at the start of World War II. The city is on an island with dimensions of twelve by twenty-four miles. A causeway leads across the Strait of Johore, which is less than a mile wide, to the mainland. Heavily fortified and considered the greatest naval base in Asiatic waters, Singapore proved vulnerable to attack from the rear and fell to the Japanese in 1942, and was occupied by them until 1945. It is the busiest entrepôt in the tropics. Half of all imports are shipped to other places. Its main interests are commercial, but there is some industry, 90 per cent of which is concerned with rubber; tires, balls, shoes, and toys. Nearby limestone furnishes raw material for cement. Petroleum is refined and stored. Tin is smelted. Palm oil, coconuts, pineapples, sago, pepper, and similar products are processed. A lively commerce exists in spices of various kinds, camphor, gums, resins, lumber, and rattan. Excellent dry dock facilities and coal docks serve ships of all nations. A busy airport is used by British and Dutch lines between Europe and the Far East, East Indies, and Australia.

Malacca (20,000), considered "the Gates of China" by Soleyman in A.D. 850 and the original European equivalent of Singapore, is of little consequence today. One of its residents was actually the first person to make the trip around the world. *Malacca Henry*, a slave purchased by Magellan in 1512, had been as far east as Cebu before being taken on the great voyage across the Pacific. His completion of globe encirclement occurred a year before any European reached Iberia. *Kuala Lumpur* (80,000), capital of the federated states, is a commercial and plantation center. *Georgetown* (27,000) is ordinarily known as Penang, the name of the island upon which it is located. It smelts tin and serves as a minor port for entrepôt trade. The harbor is one of the best in the realm.

PHILIPPINE ISLANDS

The Philippines lie somewhat over 200 miles due south of Formosa, well to the southeast of any part of China and about 700 miles east of Indo-China. Linear Palawan nearly reaches the northern tip of Borneo and a chain of small islands south of Mindanao leads toward the northeastern corner of that same huge island. Other island stepping stones lead southward toward Celebes.

The entire group consists of over 7,000 islands, of which over 1,000 are inhabited and nearly 500 have areas in excess of one-quarter square mile. The combined area is over 115,000 square miles,

or somewhat more than that of Arizona. Two islands, Luzon (40,814) and Mindanao (36,906) constitute two thirds of the area. A population of 20.2 million is roughly twice that of 1898, when the United States obtained possession from Spain, and over ten times that of 1800. Thirteen islands account for 92 per cent of the population; on them the average density is over 400 per square mile.

Stretching for 1,500 miles across latitudes from slightly below 5° N. to above 20° N., the Philippines are somewhat less equatorial than other parts of the Malayan Realm, and have a somewhat better climate. Rainfall exceeds 40 inches everywhere, and is excessive in many places. Distribution is quite uniform throughout the year in the south and along the east coasts, but the northwestern islands have a dry season between November and March. Typhoons are severe and come all too often in the northern islands, the worst season lasting from April to December.

Nearly 60 per cent of the surface is forested. There are some 600 distinct species of trees, 100 of which are useful. Mangrove swamps block many coasts. Tropical rain forest covers most uncleared lowland and mesothermal rain forest is the typical upland assemblage. About 18 per cent of the surface is grassland, some of which appears to have originated through fire agriculture. Many types of grass are coarse and useless. About 22 per cent of the surface is farmed, and it is thought that the amount could be doubled if necessary. The finest agricultural lands are in central and southern Luzon, southern Panay, Cebu, western Negros, and Leyte. Over half of the land is cropped on some of the smaller islands.

The four main types of natives are Negritos, Igorots, Moros, and Filipinos. Only the former are non-Malay.

Aboriginal Negritos are few in number and dwell mainly in remote forests, though some live within fifty miles of Manila. Their material culture is primitive, lacking dwellings other than crude and temporary shelters. Hunters of deer, pig, and other game by poisoned arrows, these small, shy people are rarely visited by outsiders.

Early Malays arrived in the southwest and settled coastal lands. The appearance of other Malays forced them to withdraw inland, so that they have become the mountain tribes of today. As primitives, they normally wear loin cloths, *tapls*, that are tucked in at the waist like a sarong and hang down to the knees. Tribes vary considerably as to matters of hairdress and ornaments. Altogether there are some eighty distinct tribal

groups, collectively known as Igorots. They are divisible into more than forty distinct ethnic groups, and speak eighty-seven different languages or dialects.

The Igorots are short, stocky people, with powerful limbs and flat noses. They are noted for feats of physical endurance such as carrying heavy loads for long distances in remarkably short periods of time. During World War II many were useful allies of American forces. As a group they are intelligent and some have been educated. Under normal conditions they have had few opportunities. Most are pagans who live in constant fear of taboos and fellow man. Some engage in head hunting, as evidence of valor in physical combat. Europeans are not fair prizes and seldom become victims of attack. The heads desired are those of specific individuals of nearby enemy tribes.

The Igorots remaining most savage and least responsive to European influence are the Kalinga.

The Bontoc are great warriors, noted for Spartan culture traits. The Ifugao, though not averse to taking a head on occasion, built spectacular terraces for raising rice in northern Luzon on hill-sides so steep that few peoples would have attempted their use for agriculture. Their engineering skill is amazing; it is no simple matter to construct terraces with gradients steep enough to permit the flow of water and provide effective flooding, yet flat enough to resist erosion. Benguet Igorots near Baguio are peaceful agriculturists who have the peculiarity of smoking their dead in sitting posture, removing them to caves where they remain in a reasonably good state of preservation for many years.

The Moros are Later Malays, similar in most physical regards to the Filipinos, but they differ culturally in such varied aspects as being fanatical Moslems, filing their teeth to points, and chewing betel nut, which blackens the teeth. Their Mohammedanism is mixed with many pagan practices and beliefs. Some Arab blood and many Arabian culture traits help differentiate the group.



Ifugao rice terraces (American Geographical Society)

In writing, they employ the Arabic alphabet. The Spaniards were impressed by these culture traits and named them Moro, which means Moor. On land they are capable fighters, and on the sea skillful pirates and masters of fast sail boats, *vintas*. Moros remain unconcerned with modern politics and economic problems, other than a general desire to be let alone.

The Filipinos are Later Malays with a strong Chinese strain. They farm, but rarely engage in business. Politically minded, they control the government, education, and the churches. Almost all inherit Christianity from Spanish days. Spanish is widely spoken among the upper classes, though the younger generation has been educated in English. As a group they are the most Americanized people on the islands and realize keenly the need of American help if their republic is to survive. They possess the best agricultural lands. In Luzon they were successful in depriving the Ilogos and other more primitive peoples of whatever valuable lands they possessed. The leading Filipino languages are Tagalog, which has been adopted as the national tongue officially, Ilocano, and Visayan. Ilocano has a rather rich literature. Only about one quarter of the Filipinos understand Tagalog.

The main food crops are rice, maize, and sweet potatoes. Rice occupies about half of the tilled land in use for growing food, and a fair share of the crop is raised by Chinese. Maize is planted on soils with better drainage and ranks second among food crops. Many warm-climate fruits enter into diets, including such familiar ones as oranges, pomelos, limes, bananas, papayas, and guavas, and such less-well-known tropical fruits as lansones, santols, and jack fruits. Only about a quarter of the cultivated land is irrigated and about one twelfth raises more than one crop per year.

Half of all agricultural land is used for plantation crops. Coconuts are grown on sandy coastal plains below an elevation of 1,000 feet. The Philippines rank first in production of palm oil and second in copra, producing more than three times the value of coconut products from the entire Pacific World. They also produced one sixth of the world's sugar during the period 1920-1934. Manila hemp is a specialty. Though it occupies more land than sugar cane, it yields a smaller return. The source is a plant resembling the banana which thrives under rain forest climatic conditions in southern Luzon and in Mindanao. The fibers make exceptionally good rope with great strength and resistance to salt water, so that it serves better than any other material for hawsers and lines of all sorts on ships. Tobacco has de-

clined in importance since Spanish days. It now occupies only 2 per cent of cultivated land. The distinctive flavor of Philippine tobacco has made it a favorite in many lands, especially around the borders of the Pacific. Rubber and pineapple are also plantation crops. Half of the national income is derived from coconuts, sugar, Manila hemp, tobacco, and embroidery. The dependence on plantation agriculture is so strong that one fifth of the food is imported.

Typhoons and locusts are the main agricultural hazards. The former are most severe in the extreme northeast, where there is relatively little farming, but the latter swarm over good lands at times and settle in sufficient numbers to flatten sugar cane under their sheer weight. Far more serious than these plagues is a threat of changes in the American tariff policy. The islands prosper when sugar, coconut products, and other commodities are admitted without duty, but grave economic conditions would arise if the United States were to apply regular rates on such imports.

The textile industry includes making *pina*, a pineapple cloth, and *husi*, a Panay banana fiber blended with Chinese silk. Embroidering was introduced by the Spaniards and has been carried on with skill as a local industry of considerable export importance. Little industry, however, has gone beyond the stage of simple agricultural processing.

About 9,000 nonmilitary Americans were resident at the outbreak of World War II. Some 120,000 Chinese and possibly 750,000 part-Chinese were in control of most business, including three quarters of the retail trade, lumbering, and carrying goods between islands or to the Asiatic mainland. Some 30,000 Japanese lived in the south, where they carried on 80 per cent of the deep-sea fishing and considerable agriculture.

Mineral resources are abundant. Gold constituted 85 per cent of the value of mineral production between 1936 and 1940. Most of it was mined in the Benguet district, near Baguio in northern Luzon, where a fivefold increase occurred during the late 1930's. Good iron ore, mined in eastern Luzon, Samar, and eastern Mindanao, is available to water transport. Most of the export has been to Japan. Coal and petroleum reserves appear to be inconsequential, but there is a large, undeveloped hydroelectric potential. Chromium, a late discovery, is possibly the most valuable mineral resource of all. The deposits seem to be the richest known and already constitute 11 per cent of the world's output. Silver, copper, bismuth, mercury, platinum, nickel, zinc,

lead, and manganese have been mined in limited quantities.

Luzon about the size of Indiana, is the main seat of plantation agriculture. Most sugar is produced north of Manila, and most coconuts to the south. Tobacco is a specialty of Cagayan Valley, north of Manila. The finest food-producing lands extend northward from Manila Bay to Lingayen Gulf. Nearly half of that area is given to rice. Much of Luzon is mountainous. Taal, a volcano not far from Manila, has erupted many times, killing 1,300 in 1911. Mayon, in southern Luzon, rises nearly to 9,000 feet as a practically perfect cone. Apo, in Mindanao, is the highest peak in the islands; about 10,000 feet. Altogether there are about fifty peaks above 5,000.

Manila (1 million) is capital, principal port, and the main center of education, commerce, and industry. On the delta of Pasig River it became the site of a Spanish walled city which was surrounded by a moat. This Intramuros is about four centuries old, and contrasts sharply with the modern wharves and buildings of the new Manila. Under the Spaniards Manila gave its name to a fiber (Manila hemp) that became world-famous and a widely known variety of cigar tobacco. Cigar making is still in Spanish hands. Under American direction Manila became the healthiest lowland city in the tropics. Infant mortality was reduced from 80 to 6 per cent, and epidemics were practically ended. Baguio, a highland resort similar to Indian "summer capitals," offers an attractive climate during the season, March to June, when lowland conditions are most oppressive to Europeans.

The *Visayan Islands* of the central Philippines are much more densely populated than Luzon. On Bantayan the density is 640 per square mile, four times that of Luzon. Several islands are more than half cultivated. Cebu is particularly favorable for crops, as its lowland rainfall is only about forty inches, a moderate amount in the latitude of 10° N. Maize, rather than rice, is the leading crop. La Cruz Creciente, a huge wooden cross, marks the site where the first mass was held in the Philippines, and has become a religious shrine of significance. The city of Cebu (168,000) is a commercial center in a rich agricultural area. The island of Negros has excellent volcanic soils for growing sugar cane.

Mindanao, the home of 2 million people, is comparatively undeveloped. Its uplands provide an attractive climate, but are covered by virgin forests. They constitute an important reserve of hardwoods, including *lauan*, a Philippine mahogany, which is a soft, pleasantly scented, light-colored cabinet wood. Cattle range in open territory. Coconuts, Manila hemp, rubber, bananas, and pineapples are raised as lowland plantation crops. Copra is the most valuable export, though there is some mining of iron, gold, and tin. Davao, near the foot of Mt. Apo, contains half of the Japanese population of the islands. That these were not planted as spies, as many people think, is indicated by the fact that they arrived in 1904, and have been busy raising Manila hemp for export to Japan ever since. They are industrious agriculturists. A fishing population undoubtedly contributed a good deal of expert information about coastal waters to the Japanese navy, as they did along the shores of the Pacific Basin generally.

47: Burma, Siam, and Indo-China

Between the three culture realms of the Oriental World is a broad transitional zone, a cultural shatter belt that extends northward from the Kra Isthmus to the borders of the Dry World in Tibet, and eastward from Assam to southwestern China. This "Farther India" resembles the European Shatter Belt in having been territory subject to invasion by widely diverse peoples on many occasions, with the result that fragmental remnants of many different cultures now live in rather close proximity. Politically it includes a small part of India, all of Burma, most of Siam, and all of French Indo-China.

This cultural frontier has less population density than lands to the east or west; about 65 million people on 750,000 square miles, or about 87 per square mile. It is chiefly unprogressive territory typically inhabited by people who feel that they cannot afford to experiment. They know that they must eat and that their old methods of obtaining food have served practically. Great aversion is shown toward the adoption of new implements or the introduction of new crops. As true Orientals they are also concerned with loss of face. A progressive or experimental person would find little sympathy should he fail in attempting departures from old ways. Status quo is the keynote of the region. To more progressive outsiders, however, it is young country, a frontier offering abundant opportunities for better living or commercial exploitation.

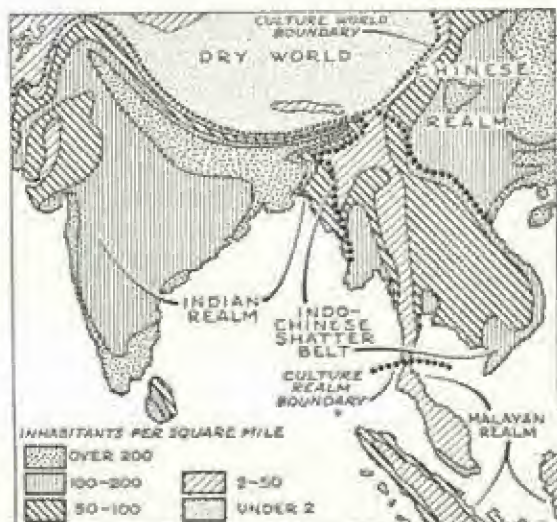
For the masses of natives, life is relatively simple and as carefree as in much of the Malayan Realm. Houses need protect only against rain and sun, so do not require the more careful construction that excludes bitter cold. Clothing may be of simplest sorts. Little interest has been taken in sanitation or public health. Malaria is the chief cause of death, but typhoid, smallpox, cholera, and dysentery take huge tolls. Birth and death rates are about equal, so population remains about constant.

Europeans have exploited these lands, and their national economies are tied in with conditions in Europe and America. Most of the natives have little knowledge that difficult times result from economic depressions elsewhere. Closer to the

masses is a local economy, which is mainly in the hands of the Chinese who are the merchants, brokers, creditors, and the owners of much of the land. Peasants normally pay as much as half of their crops for the land they use, and most of them are kept in perpetual debt. Though many go hungry, each country normally produces a surplus of food for export. Rice, timber, and minerals are sent to other lands in quantity.

Physically the Indo-Chinese region is characterized by north-south mountain trends. Cultural and economic contacts follow valleys of the Irrawaddy, Salween, Menam, Mekong, Songka, and other streams, along the lowlands of the regional grain. They are blocked by the high mountains between valleys. Individual deltas and the flood plains extending upstream tend to become ethnic, political, and economic units. Rugged barriers between valleys tend to become the retreats of primitives. Climates are more or less monsoonal, depending on location. The natural vegetation varies from open to dense forest in most uncleared lands. Some of the forest is too dense for aboriginal inhabitants.

Siam (Thailand), the central buffer state of the region, has remained politically independent. To



Southeastern Asia: culture boundaries



Indo-Chinese Shatter Belt: relief

the west is territory under the control of the British during the last century or so, in Burma and Assam. To the east is French domain.

Many of the primitives are strongly Caucasoid. Originally they occupied lowlands, but as wave after wave of increasingly Mongoloid invaders appeared the aboriginal inhabitants were crowded back into hills or mountains. Generally speaking, the most Caucasoid and most primitive peoples are now mountain tribes, such as the Miao. Somewhat more Mongoloid and more advanced tribes, such as the Lolo, occupy hills. The most Mongoloid occupy the lowlands.

Among the partially Mongoloid early invaders were people resembling Early Malays who are thought to have come from central Asia. Archæic Caucasoid physical traits were present in these people and they migrated southward into lands that had long been occupied by Negroids. Traces of the latter have practically vanished, except in the Malay Peninsula and islands toward the south. Tibeto-Burman and Mon-Khmer speakers came later, the former being an important element in populations to the west, and the latter in the east. Many of the latest pre-Commercial Revolution invaders came from southwestern China. Later Malays crossed from Sumatra into the Malay Peninsula, where they inhabit a small part of Siam.

Though many inhabitants of coastal Burma and the fringes of Indo-China speak Trade Malay and other forms of Malayo-Polynesian, the dominant language family in all of the southeastern Asiatic shatter belt is Indo-Chinese. The following table lists some of the more important languages in this group.

The geographical distribution of languages, it should be noted in the table, is about as complex as that in the European shatter belt, and for similar reasons. Closely related peoples in some cases have migrated to areas that lie far apart. This is true of Ural-Altaic groups in Europe. A good example in southeastern Asia is the presence of Mon-Khmer-speakers in the Khasi Hills of Assam and in Cambodia, places about 1,500 miles apart. Only rather distinct languages are shown in the table. Burmese, for example, is commonly subdivided into sixteen different dialects, and many of the other languages have several variants.

BURMA

Burma was administered as part of India between 1826 and 1937, when it became a "self-governing" commonwealth. In 1948 it severed all ties with the British and became an independent nation. Its area of about 262,000 square miles is just about that of Texas. With some 19 million

Table 28 Languages of the Indo-Chinese shatter belt

INDO-CHINESE

CHINESE-SIAMESE

Sinitic

Northern (Chinese: Mandarin, Amoy, Canton, Foochow, Ningpo, Shanghai, Swatow, Wenchow, etc.) of China.

Southern (Karen) of lower Burma.

Tai (Shan)

Shan (Shan: Ahom, Khamti) of upper Burma and southwestern China.

Siamese (Siamese, Lao) of Siam.

TIBETO-BURMAN

Tibeto-Himalayan (Tibetan or Bhotia: Balti, Lho-ke, Ladakhi, Lahuli, Kanawari, Kiranti, Mangar, Murmi, Newari, Limbu, Rong or Lepcha) of Tibet and the Himalayas.

North Assam (Aka, Dafla, Abor-Miri, Mishmi) of northern Assam.

Assam-Burmese

Bodo (Bodo: Koch, Kachari; Garo, Tipura) of Assam and eastern Bengal.

Naga (Naga-Bodo: Miki; Empeo; Naga: Angami, Ao, Lhota) of eastern Assam.

Kuki-Chin (Melihe, Old Kuki, Kuki, Chin: Lushei, Khami, Lai) of southern Assam and western Burma.

Kachin (Kachin) of upper Burma.

Burma (Burmese: Arakanese, Mru) of central and lower Burma.

AUSTROASIATIC

MON-KHMER

Mon-Khmer

Southern (Khmer) of Cambodia.

Mon-Annam (Mon or Talaing, Annamese) of lower Burma and Annam.

Northern (Palaung, Wa) of upper Burma and southwestern China.

Khasi

Khasi (Khasi) of Assam.

people, the population density is over 70 per square mile; over twice that of Texas, the density is low in comparison with India, China, or Java.

Burma has the most pronounced regional grain (belted topographic patterns) of any country on earth. A narrow coastal plain lies to the west of Arakan Yoma, the range between the valley of Ka-La-Dan (which terminates at the port of Akyab) and the country's main lowlands, which lie along such rivers as the Irrawaddy, Chindwin, Sittang, and Salween. The north-south Pegu Yoma lies between the Irrawaddy and Sittang to the south of the Irrawaddy-Chindwin junction. Part of the upper Irrawaddy is aligned with the Sittang, so that easy communication exists between the main valleys of central Burma. The railroad from interior Mandalay to coastal Rangoon, both of which are on the Irrawaddy, takes a direct

route southward, along the Sittang. High ranges and rugged uplands separate lowlands in upper Burma.

There are three coasts, two long ones which run north-south, separated by a short, east-west, offset. The long coasts are flanked by relatively little lowland and hence are unimportant commercially. The short central coast is a deltaic plain, built by the large rivers that discharge into the Gulf of Martaban, and is the key to the lowlands where most of the population is concentrated.

Northeastern Burma is a westward extension of the Plateau of Yunnan, a region with typical upland elevations of about 4,000 feet. The Salween, Mekong, and other rivers entrench the plateau deeply. This northern region, the Shan States, is remote in terms of cultural or political ties with the lowlands of central and lower Burma.

The lowlands are peculiarly isolated, partially because the bordering topography is rugged, and also because the British have chosen that they so remain. Railroads and highways could have been constructed to India many years ago if the British had thought it expedient. Actually the only connections are a few trails and primitive roads. All Burmese railroads keep well within the limits of the country. The only significant road connections to any foreign country were those constructed by the Chinese since 1939, from Chungking, through Yunnan, to the terminus of a railroad leading from Mandalay to Lashio, and an alternate route to the north leading to Bhamo on the navigable Irrawaddy.

The old Caucasoid inhabitants of Burma are now confined to remote areas, displaced by Mongoloids who have been coming southward and westward for many centuries. The occupying of lowlands by more aggressive peoples ordinarily involves more than a relationship between invaders and those directly invaded. A group displaced usually shoves another ahead of it, and so on until the ramifications are quite complex. The more primitive are not only forced into the least desirable areas, but they also are likely to become scattered as well. In general, there is a transition in which cultures are progressively more and more advanced towards the lowlands. From the racial standpoint the series ordinarily runs from most Caucasoid in the mountains to most Mongoloid on the rice-producing lowlands.

Dark-skinned, woolly headed, and thick-lipped Asiatic Pygmies survive only to the south of Burma. Fair-skinned and taller Archaic Caucasoids (Australoids), with less-woolly hair, but

rather full lips and flattened noses, remain as unimportant aboriginal tribes. Most of the primitives in Burma, however, are more-Mongoloid Tibeto-Burman speakers, such as the Chins.

About 10 million people in Burma speak Burmese, and several million others understand it. With English it serves as an official language. Many of the more recent invaders brought Sinitic tongues. Recent immigrants from India ordinarily speak Tamil because most have come from Madras. About a million people speak some kind of Indian language. Indians resident in Burma for several generations are likely to consider themselves as Burmese and adopt that tongue.

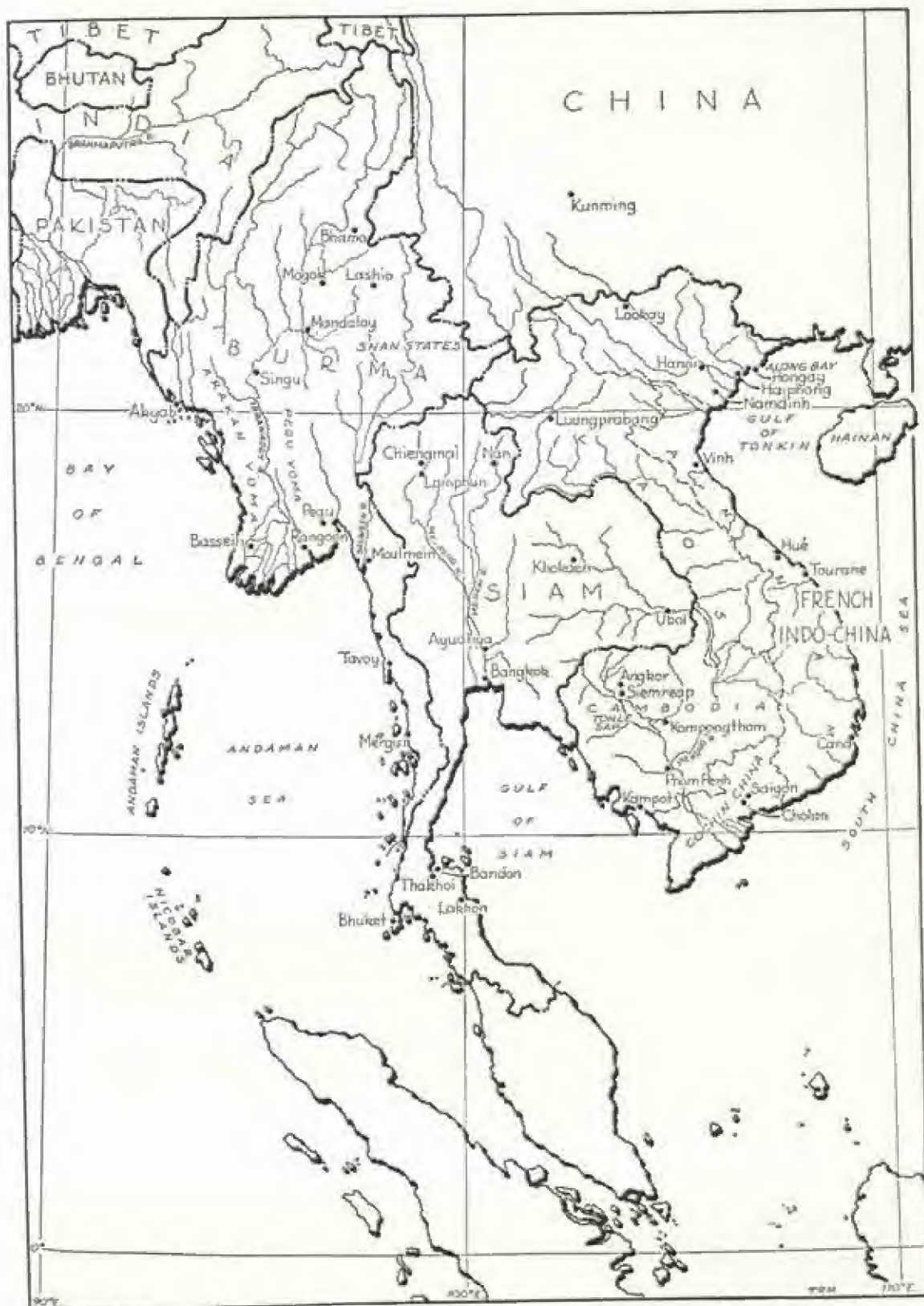
Lower Burma is relatively homogeneous from racial and linguistic standpoints. The physical isolation of its flood plains tended to discourage invaders and hence to exclude racial minorities, such as abound in the more accessible lowlands of Siam and Indo-China. About 85 per cent of the population are Buddhists. Hindu, Moslem, Christian, and pagan minorities are small.

While European nationalism is foreign to Oriental World political thought, lower Burma is so dominated by Burmese and so closely knit in many ways that it seems to offer a prospect of nationalistic development closer to patterns established in Europe than the Shinto-inspired nationalism of Japan. Burma is the most literate nation in southeastern Asia. Its peoples are united in hostility against India. Burma gained valuable political experience in the decade ending in 1948. Its native legislature had the power to enact certain kinds of laws and a fair amount of administration was in local hands.

About one third of Burma is more or less outside of the limits of official administration. Local rulers govern undefined territories in mountainous and remote parts of the country. The populations thus organized are small and comparatively unimportant.

Lower Burma, the true heart of the country, lies chiefly along the flood plains of the Irrawaddy and Sittang rivers. Population is relatively dense and agriculture well developed. The Arakan Yoma shelters the lowlands from excessive precipitation, but the annual rainfall is about 100 inches in the south, and about 40 toward Mandalay.

The delta coast is fringed by mangrove swamps, behind which lie the finest rice-growing lands on earth. These have been developed almost wholly during the last century. Prior to the days of oceanic steamers there was little international trade in rice, and much of lower Burma was uncleared jungle. Cheap transportation made raising of a money crop possible and established lower Burma as one of the world's most important



Indo-Chinese Shatter Belt: Index map

granaries. About 90 per cent of the flat land in the deltaic plain is planted to rice. For a rice-growing region the population is still rather sparse; about 200 per square mile.

Most of the rice is raised by tenant farmers. Those who produced the best crops ordinarily faced a squeeze of higher rentals in succeeding years. Burmese were wary of the system, so the landowners turned to one of the world's greatest reservoirs of cheap labor, the Tamil-speakers of Madras. Over a million Indians were brought in as rice raisers. Indian population increased threefold between 1891 and 1931. Altogether, about 90 per cent of the rural population of lower Burma turned to rice production. When the effects of financial depression in Europe and America reached Burma in 1934, rice prices dropped so low that the people who raised it could no longer afford to purchase other necessities of life.

Burma normally exports about half the rice it grows, to India in most years, but to China in some, depending on who has the poorer crop, or can afford to bid the higher. The country is so specialized that the value of exported rice normally exceeds that of all other products combined.

Populations rarely fare well in lands with such extreme specialization in a single crop. When the depression of the mid-thirties became acute about half of the Indians were shipped back to Madras. Tremendous resentment arose against them for several reasons, the principal one, low rice prices, being entirely beyond their control. The Burmese regarded Indians as intruders who had reduced their own opportunities, overlooking the fact that the importation of Tamil-speakers was caused by their own vicious system of tenant farming. Thoroughly justified was the indictment that as money lenders Indians had used the Burmese harshly. Riots against Indians became serious in 1938 and 1939. Since 1941 they have been admitted to Burma only in small numbers, and not as competitors with native labor.

Rangoon (500,000), capital and main commercial center, prospers as a result of Burma's isolation and poorly developed communications. It is the spout of a funnel through which almost all foreign trade must flow, actually about 90 per cent. It is the main terminus of all railroads. Inland and to the left of the Irrawaddy delta, it is a river port by grace of a short canal. Steamboats run 900 miles up the Irrawaddy and 300 up the Chindwin. Though some petroleum arrives from fields about 300 miles to the north by pipeline,

most of it reaches Rangoon on barges. It is either refined there or exported in crude state.

About half of the people and 70 per cent of the skilled laborers in Rangoon are Indians. Health conditions are poor, malaria being prevalent there as everywhere else in lowland Burma. Rangoon has one of the world's highest death rates from tuberculosis. The pioneer characteristic of population is indicated by a high percentage of males, about two thirds of the entire population.

Industries are concerned almost entirely with rice, lumber, and petroleum. About two thirds of the foreign trade is with India, the principal items of export, in order, being rice, petroleum products, teak, other timber, rice bran, metal ores, and hides and skins. Deodar and pyankado (a form of ironwood useful for railroad ties and other purposes) are the leading timbers exported. Minor exports include tobacco, cotton, and vegetable oils.

Bassein, to the right of the delta, is a minor port for shipping rice. Pegu, a short distance northeast of Rangoon, is an old center of ceramic industries. Its large porcelain jars, *martahans*, are to be seen everywhere in southern Asia and in the East Indies.

The Burmese are skilled in many native crafts, some of which have created markets abroad. Their workmanship is especially good in carving wood and ivory, creating jewelry of distinctive design, bronze work, and lacquer wares. Various towns along the Irrawaddy are widely known for individual specialties.

The Irrawaddy Valley is a downfolded, synclinal region in which a thick section of relatively young marine sediments has been deposited. Most such structural troughs or basins are places where petroleum is likely to be found in paying quantities. Burma follows the pattern. Several important oil fields have been discovered, and others will be found in the future. Near them arise "oil towns" that contrast sharply with native villages. The latter are primitive and lack such services as adequate sanitation.

Mandalay (164,000) is an older capital and the leading city of upper Burma. It is connected with Rangoon by river, highway, and rail; the trip by passenger train takes eighteen hours. Its surroundings are much drier than those of Rangoon, but some rice is raised. Rice, however, is not the main concern of the population, nor even their leading food. Beans, millets, and sesame are grown in large quantities. Tea, oranges, cotton, and tobacco are important cash crops. Lac, tung oil, peanuts, sugar cane, silk, and other sources of agricultural income provide a diversity of interests. When rice prices were low and Indians were being sent home from the delta, upper Burma remained relatively

prosperous. Its diversification, unplanned but necessitated by a wide variety of soil, drainage, and climatic conditions, was the basic reason for a rather satisfactory financial position. Forest industries, petroleum near Singu, ruby mining at Mogok, and trade with the Shan States contributed to the prosperity.

Both Rangoon and Mandalay are important Buddhist centers. Spired sacred buildings, many of which suggest Chinese pagodas, give Burmese urban landscapes a distinctive, thoroughly Far-Eastern, stamp. The general effect of the religion has been conservative. In recent years there have been important changes and the appearance of signs that Burmese Buddhism can adapt itself to new conditions, but it has not become the progressive, driving force of Buddhism in Japan.

The Shan Plateau is inhabited by various peoples, most of whom have been driven westward from southern China during the last twenty centuries. The dominant Shan are about one million strong and arrived from China in the seventh century. They are closely related to the Thai of Siam and many minority groups still resident in southwestern China. They engage in agriculture, have developed minor industries, and exploit their mineral resources. Silver, lead, zinc, and copper are abundant. Rubies, sapphires, lapis lazuli, and other gem minerals contribute materially to the value of Shan States exports.

Northernmost Burma and uplands extending westward into Assam are inhabited by Kachins and many other non-Burmese peoples, who cling to rugged territory with numerous, isolated valleys separated by steep slopes. Uplands culminate in summits with more than 10,000 feet elevation. Rainfall is generally excessive. Monsoon jungle forest and shrub extend up to about 3,000 feet, above which the rain forests are particularly dense. The remote highlands are beyond the reach of either Burmese or Indian governments. Some 20,000 Kachins occupy fortress-like homes in the farthest refuges. A few have moved down into the valleys, to raise rice and opium.

Millet, maize, and upland rice are raised by primitive methods. Elephant capturing and training is a specialized occupation in the lower, more open forest zone. Highlands extend southward to a rocky and undeveloped coast with many fine harbors, only one of which, the relatively unimportant port of Akyab, has any significance whatever. That port serves a local agricultural plain to the west of Arakan Yoma.

The southern tail of Burma, the north-south Tenasserim coast below the Gulf of Martaban, is about 500 miles long and little over 50 wide at any place. Moulmein, at the northern end, is port

for the Salween Valley. It exports rice and timber, but has little industry. Farther south are coconut plantations and mining centers. Tavoi and Mergui mine and export tin and tungsten ores. Excessive rainfall has led to a limited development of rubber plantations, the export leaving from Mergui. Communications are poorly developed, and the population is sparse.

On the whole, the cultural landscapes of Burma are those of a young country and exhibit many pioneer characteristics. Though about 40 per cent of the surface is suitable for agricultural use, only about 10 per cent is actually planted. In spite of large lowlands that produce an abundance of rice, and could raise several times as much, population densities are low for the Oriental World. Lumbering, mining, petroleum exploitation, grazing, and hunting are occupations of a relatively large part of the total population. Manufacturing has gone little farther than processing agricultural products. Though native craftsmanship is highly developed here and there, it has not been organized industrially or commercially. Both rural and city populations have increased rapidly during the last few decades. Many immigrants have arrived, including about 200,000 Chinese and several times as many Indians. The country could support far more, particularly if agrarian reforms and better farming methods were adopted. No problem of population pressure threatens, at least for several decades.

SIAM

Siam, Prades Thai or Muang-Thai, was officially known by its ancient name, Thailand, between 1939 and 1945. It is essentially the drainage basin of the Menam, with a southern tail extending down the Malay Peninsula past the Kra Isthmus, and an eastern bulge into Mekong drainage. Politically it is a buffer state for which neither the British nor the French cared to fight the other. The country remained an absolute monarchy until 1932, one of the last to survive.

With an area of over 200,000 square miles, about four fifths that of Texas, and a population of 18.8 million, the average density is about 94 per square mile, small in relation to agricultural potentialities. About 400,000 Malays and possibly a million Chinese are included. Estimates vary widely as to the Chinese population, partially because many of the Siamese are essentially the same people as many of the southern Chinese.

The country is divisible into several parts which differ considerably in physical characteristics and

in peoples. Northern Siam is commonly known as western Laos. The Lao-speaking population is strongly Mongoloid, but some mountain tribes exhibit strikingly Caucasoid physical traits. It is a hilly region of Menam (Menam really means "river," and the full name of Siam's main stream is Menam Chao Bhraya) tributaries. The Me-Ping is navigable as far as Chiangmai, an important center of caravan trade with places as remote as Soviet Asia and western China. Small boats make the trip upstream from Bangkok in three weeks during high water, but require three months when stages are low and shoals block the channel. The two cities are only twelve hours apart by fastest train. Nan, in about the same latitude as Chiangmai, but farther east, is the head of navigation for river steamers on the Menam. It is a center for curing fish that are stranded in great quantities whenever river stage drops suddenly.

The hills of western Laos are forested and furnish the world market with many valuable woods, including teak, rosewood, ebony, and boxwood. Teak thrives at an elevation of about 2,000 feet

in places where the annual rainfall exceeds 80 inches. The main stands are depleted, so that lumbering has become more expensive and incomes have dropped appreciably during recent years. Much of the soil is badly leached and therefore has little agricultural value. Better soils occur toward the east, but rather prolonged winter drought, the reason for greater fertility, is a handicap to crop raising. Some upland rice is grown, along with a diversity of crops resembling those of upper Burma. Fowls and pigs contribute heavily in maintaining the population. Incomes are supplemented by mining.

Lampun, close to Chiangmai and on the northern border of the central plains of the Menam, was the capital of Laos and Thais in the sixth century. It was a march-site, a western outpost of peoples closely related to many of the southern Chinese. Earlier, Mon-Khmer-speakers were displaced both into uplands and southward along the Menam plains, eventually reaching Cambodia, in Mekong drainage of French Indo-China. As the Laos and Thais spread southward along the Menam, the Mon-Khmer peoples were more and more effectively divided into western and south-



Pre-Thal Mon ruins southwest of Bangkok (American Geographical Society)

eastern groups. A great wave of Laos and Thais appeared after 1250, when Kublai Khan expelled them from southern China. Some remained in northern Indo-China, while others went farther west, into Siam and the Shan States. Eventually these distinctly Mongoloid peoples crowded southward along the Menam to the coast. For a long time their southern boundary was not far from the junction of the Me-Ping and Menam. By 1350 the Laos and Thais of the lowlands were fused into a single group, the Siamese. Ayudhya (Ayuthia), not far north of Bangkok, became their capital, a march-site on the southward-advancing frontier.

At present more than ten times as many people speak Siamese than all the other languages of Siam combined. The tongue is divisible into several distinct dialects, but all are so similar that the speaker of one has no difficulty in carrying on a conversation with the speaker of another. The Thai, or Siamese, are firmly established over the entire Menam delta. As invaders from hilly territory they brought no experience in raising lowland rice, but that crop now occupies over 90 per cent of lower Siam's agricultural lowlands and furnishes the country with its chief export. About 80 per cent of the population is agricultural, ten times as many people as engage in the second occupation, fishing.

The lower Menam is malarial country, subject to widespread floods during the summer monsoon season from May to October. It has few roads, but has an excellent system of canals that serve not only to irrigate and drain rice lands but as avenues of communication as well. Ayudhya has become an important railroad junction, with lines radiating north to Chiangmai, northeastward to Khokaen (Kon-ken) and Ubol (Ubon), and southward to Bangkok, where a connecting line leads down the Malay Peninsula to Singapore, and an eastern line runs across the frontier of French Indo-China.

Bangkok (827,000) is the one large city and the only real port for international trade. In the heart of the city are the old royal palace and the official buildings. A walled, inner, brick city is surrounded by an extensive, low, wooden native residential district, with many houses on piles and along raft streets. One third of Siam's rice crop and huge tonnages of fish are exported, chiefly to China and Java. Teak logs arrive as rafts to be sawn and exported as lumber. Rubber, coconut products, tobacco, pepper, and cotton are other items of export. Bangkok is a political and commercial city, not an industrial center.

The long southern arm of Siam reaches into purely Malayan territory. A railroad tends to bind it economically to Siam, but the tie is weak. Singa-

pore is closer to southernmost Siam than is Bangkok. Linguistic and ethnic ties are closer to the south. Siam extended even farther into Malayan lands until 1909, when the British acquired several of the northern Malay states. The political hold on the peninsula south of Kra Isthmus is one that might be broken at any time.

The narrow Kra Isthmus is a potential canal site of considerable importance. Without attaining an elevation of more than 100 feet (Panama Canal, 85 feet) a canal could connect the Gulf of Siam with waters of the Mergui Archipelago, saving 600 miles of sailing distance between Calcutta and Hong Kong, or about twice that amount between Rangoon and Bangkok.

Bandon, near Thakhoi, is a timber-producing center on the peninsula. Lakhon (Nagor Sridharmaraj; Sritamarat), an ancient city that was once capital of a state embracing most of the Malay Peninsula, has an excellent harbor and a productive hinterland that supplies rice for export. Bhuket (Puket) is a west-coast center of tin mining. Tin is the only metal exported in considerable quantity from Siam, a fact largely responsible for the country's political hold in Malayan territory.

The modern airport at Bangkok is really more of an anomaly than the extensive ruins of old palaces and pagodas at Krang Kao, an old capital near Ayudhya. Though most of the inhabitants of Siam are descended from peoples who arrived less than a thousand years ago, the country displays an antiquity such as can develop only in the tropics, where decay is speedy and vegetation stands ready to spread over every sort of surface not in active use.

FRENCH INDO-CHINA

Far less homogeneous than lower Burma, or even than Siam, French Indo-China consists of several contrasting parts, each of which is inhabited by a distinctive population. Cochin China is the Mekong delta and a small upland territory in the extreme south. Cambodia is almost wholly a vast lowland that drains hesitantly into the lower Mekong. Annam is a long mountainous tract sloping toward the South China Sea and the Gulf of Tonkin. Laos extends along the western slopes of the mountains and northwestward into highlands on either side of the Mekong. Siam's eastward bulge projects into lowlands between Cambodia and northern Laos. Tonkin centers along flood plains of the Song-Bo (Black River; Papien), Song-Lo (White River), and Song-Ka (Song Koi, Red River; Yuan). Its heart is the deltaic plain

northwest of the Gulf of Tonkin, but it includes highlands that extend inland to the borders of Yunnan.

The lowlands of Cochin China have an average temperature of about 80° F. during every month of the year, and an annual rainfall of about eighty inches, with a summer maximum. Northward along the Mekong Valley of eastern Cambodia the rainfall is generally in excess of sixty inches and is concentrated in 110 or fewer days of the year during the southwest monsoon, April to October. All highlands of southern Indo-China are excessively wet; records include such figures as 250 inches, distributed over 225 days. Farther north, along the mountains in latitudes north of 15° N., rain comes both with the southwestern and the northeastern monsoon. The winter winds pick up enough moisture in crossing the sea south of China to alter the precipitation pattern in a way similar to that along the west coast of Japan, or the southeastern coast of India. The vegetation of this strip is almost impenetrable tropical rain forest. The interior basins of Laos are comparatively dry; a rain-shadow effect similar to that of territory in the Deccan to the southeast of Bombay. Luangprabang, the main trade center of Laos, at an elevation of 1,000 feet, has a uniform temperature of about 70° F. and annual precipitation of less than fifty inches. About one quarter of the rain falls in August, during the height of the summer monsoon. The season from November to March is almost rainless. Health conditions are ordinarily quite good where there is a dry season, and extremely poor where there is none.

The original agriculturists of Indo-China were Khmer and related Cham peoples, who possessed the lowlands. Angkor, deep in the deadly lowlands of steaming and musty Cambodia (Sroc Khmer), was one of the ancient Khmer capitals and site of magnificent temples, such as Angkor Vat. These older peoples were forced into remote places, or into uplands, when the Annamese appeared as invaders from the northeast and took the finest lowlands. The Annamese are culturally about the same people as the Chinese of southern China. Laos and Thai crossed uplands from southwestern China, many remaining in Indo-China, others going on to Siam. A sufficient number settled in the northwest to become the dominant population. Khas and other primitives were driven to the hills where they now serve the outside world as collectors of lac, wax, spices, and a little silk.

The modern immigrants are Chinese, some 400,000 of whom have settled in Annamese low-

lands and Tonkin. About 42,000 Europeans live in the cities. The variety of native languages and dialects is enormous. Annamese, the most popular tongue, is difficult for others to learn. French is the lone official language. The native intelligentsia are culturally French.

After a number of fruitless attempts to gain a foothold in China proper, the French turned to Indo-China as a second choice. Cochin China was occupied and made a colony. For many years the capital was maintained at Saigon. Four other states were taken as protectorates. Vichy France permitted the Japanese to occupy all of Indo-China in 1941. It served the Japanese well as a base for aggressions southward into Dutch and English territory. At the end of World War II, a shaky form of French control was resumed. The capital was moved to Hanoi, in Tonkin. Cambodia has become an independent nation with a native Khmer king. France relinquished control of much of the north in 1954 to a communist-controlled Viet-Nam government, and retains only a shaky sovereignty over the southern part of Indo-China.

About 27 million people occupy 290,000 square miles, an average density of about 93 per square mile. This value has little significance because the population density in most rice-raising lowlands is at least 600, and in parts of Tonkin, 1,800. Only about half of the cultivated land, about 7.5 per cent of the country, is planted to rice. It has been estimated that the population density could readily be 2,000 per square mile in the 10 per cent of Indo-China suitable to raising rice, or 36 million people in all, leaving 90 per cent of the land for other uses and for additional population. In common with Burma and Siam, a great deal of land is available for colonists, or ready to absorb native population increase, should it develop.

Mineral wealth is both varied and large, but inadequate transportation has hindered its exploitation. Tin and tungsten ores are sufficiently valuable to permit expensive coolie-line transportation, but mines producing other metals must be close to railroads or navigable streams to be developed economically. Tonkin exports tin, tungsten, zinc, silver-bearing lead, and iron ores. Metals mined in smaller amounts include manganese, antimony, graphite, gold, and silver. There is also mining of phosphate-bearing rock for fertilizer. To the west of Along Bay is a coal field 110 miles in length, which exports through the port of Hongay an excellent variety of smokeless coal. Less satisfactory varieties of coal are mined at various inland points throughout the mountains of Annam. Japan obtained some iron and about 75 per cent of the coal exported between 1936 and the end of World War II.

Tonkin was long a remote part of China, both culturally and politically. Its population is similar to that of southern China, and its towns have a Chinese appearance. Surplus rice is raised on the Red River delta, the export normally going to China. The river is subject to violent floods and though many protective measures have been attempted, such as the building of control dams and revetments of masonry along the banks, overflows are so frequent that vast parts of the lowland remain sparsely inhabited. The population turns readily to silk raising. Namdinh exports a fair amount of the raw product. A small textile industry has arisen there and a much larger one at Hanoi, but the latter specializes in cotton.

It is claimed that Hanoi lay directly on the coast in the seventh century and that alluviation has now advanced the delta front to such an extent that the city now lies 60 miles inland, 35 miles of the growth having taken place since the seventeenth century. The careful study of such claims almost always proves them to be exaggerations, but there is no doubt concerning the violent floods and rapid alluviation along the lower Red River, and it is probable that the delta has advanced some distance into the Gulf of Tonkin.

Above Hanoi the river is navigable and for many centuries has served as the main outlet for Chinese Yunnan. Lao Kay is the upstream port for river traffic and Hanoi or Haiphong the lower ports, where goods leave barges, rafts, and the like, for transfer to seagoing ships. A railroad now leads to Kunming (Yunnanfu), capital of Yunnan. Haiphong serves as export center for the Chinese province and also for much other inland territory. Most trade is with Hong Kong. Though Haiphong has a rather poor harbor, its location is so strategic that the city has assumed considerable commercial importance. It is one of the most European-like places in the transition zone between India and China, and has grown along French lines. Hanoi, the capital, lies a bit inland from Haiphong. It is also an important trade center. Tin, most of which originates in Yunnan, is sent eastward and cotton yarns are imported from Hong Kong.

Laos is rather poorly developed hinterland of both Tonkin and Annam. Widespread areas have attractive climate and there are rich endowments of forest and mineral resources. Automobile roads lead across divides from Vinh and Hue, but river communication directs most commerce downstream along the Mekong, to Cochin China.

The mountains of Annam produce cattle, cinnamon, silk, tea, and various drugs and spices. Sugar cane is an important crop at lower levels to the east and much rice is raised along the coast.

An east-coast railway serves the ports of Vinh, Hue, and Tourane, all of which are comparatively unimportant. Huge reserves of fairly good coal favor commercial and industrial development, but this appears to be several decades away. A coastal railway leads from Saigon to Tonkin. Fishing is the main nonagricultural occupation, especially toward the south. Not only is there a large surplus for export but also enough to maintain an active industry in preparing *nuoc-mau* and other sauces, the basic ingredient of which is fish flesh. There is also a salt industry, as is ordinarily the case in places where large quantities of fish are prepared for export.

An invigorating climate in the southern parts of the Annamese mountain belt is responsible for the development of a number of small resorts, some of which have uniform temperatures as low as 50° F. These "hill stations" serve the more prosperous residents of Saigon. Cana (Chann hoa) is an attractive seaside resort.

Cambodia produces large surpluses of rice and fish. Rice constitutes four fifths of the food supply and nearly three quarters of the value of all exports. This "rice bag" has about the world's most favorable conditions for raising the crop, but actually produces the lowest yields per acre of any lowland country because farming methods are so primitive. Buffaloes are used to cultivate the lowest and wettest paddy fields and oxen the somewhat drier locations.

Cotton, silk, tobacco, oil seeds, and other crops are raised in Cambodia. Kampot specializes in a particularly fine quality of pepper. Half of Indo-China's silk comes from Cambodia; Phnom Penh is the center of the silk industry. The lower Mekong is shoal at many places and a rather difficult river for navigation. Its valley swarms with mosquitoes and other pests, among which one of the most serious is the leech. Death rates are high in the hot, wet, and unpleasant lowlands.

Tonle Sap, the huge lake of Cambodia, is a curious inland center for fishing. During the dry season the lake surface shrinks to an area of 100 square miles and the depth to about five feet, but floods swell the area eightfold and the depth tenfold. As a huge reservoir the lake tends to regulate floods, but more significant is the fact that it provides livelihood for a large number of fishermen who supply an important export-item for Saigon.

Kompongthom is a commercial center of local importance near Tonle Sap. Siemreap is an ancient capital near the impressive ruins of Angkor. These ruins were long in a situation too remote

for European interest, but now lie on a road that extends westward from the road net of Indo-China to the frontier of Siam.

Cochin China and Cambodia furnish more than half of French Indo-China's rice surplus. Rice occupies about 90 per cent of the land cultivated in Cochin China, and for many years has been the principal economic mainstay of the colony. Only one crop is raised each year, partially because such primitive methods are used in farming, but also because the flood season is prolonged. Toward the coast is an additional difficulty, encroachment of salt water. Many fields are protected by dikes. Sugar cane, bananas, tobacco, pepper, and sweet potatoes are secondary crops. Most of the rural workers are Annamese.

Saigon, the capital of Cochin China, is located to the left of the Mekong delta. It is a French city. Cholon, five miles away, is a busy river port with a large Chinese population. Rice is milled in

large quantities and is exported, together with cured fish, fish products, sugar, pepper, and other commodities. There is little industrial development other than preparing agricultural products for use and export. Almost all of Cambodia's foreign trade passes through Cholon.

It may be expected that a reduction in death rates will lead eventually to enormous population increases both in French Indo-China and in lands west to Assam. It is likely that the Chinese will become the dominant lowland population everywhere east of Burma. Their inability to crowd out all non-Chinese people from their own provinces between Fukien and Yunnan, however, suggests that Annamese, Laos, Thais, and other groups to the west will maintain themselves for many centuries in the uplands. As the Indo-Chinese Shatter Belt gradually becomes incorporated into surrounding culture realms, at least three quarters of its area appears destined to become part of the Chinese Realm. A relatively small portion will become Indian Realm territory.

PACIFIC WORLD

48: Physical Background

The Pacific World comprises the thousands of islands dotting the water hemisphere of the earth plus the island continent, Australia. The islands, except for a few near the Australian land mass, fall into three major groups: Polynesia, Melanesia, and Micronesia.

On the basis of aboriginal cultures, the three island groups and Australia are branches of a tree whose roots reach into the Indies and southeastern Asia. The Australian branch deviates sharply from the others, and its tip in Tasmania is remote from the base of the tree. The three island branches are rather close together and of more-recent origin, so that they are somewhat alike and less remote culturally, despite their marginal positions. Each of the four cultures failed to develop or borrow writing and each remained in the pre-metal stage.

Equally important in establishing a mutual cultural kinship, Australia and the Pacific islands are all deeply to incipiently involved in the New World Revolution. They were unknown to civilization until the Age of Discoveries. Unlike some of the peoples of the neighboring Indies, their aboriginal inhabitants have presented no successful resistance to the encroachment of European culture. No militant religion such as Mohammedanism fortified them; they were unified by no strong political loyalties to native rulers or states; their way of life, however satisfying, did not secure them against change.

Temperate or near-temperate lands in Australia, New Zealand, and Hawaii were readily colonized by Europeans. Native populations, never dense, suffered sharp decline after contact with the white man. Although this vital trend is now largely reversed, it means no strengthening of the old way

of life. Irrespective of future racial composition, cultures will fit the plan of New World civilization.

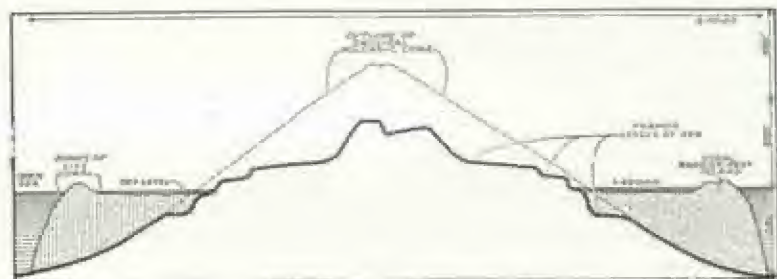
THE NATURAL BASE

Of all the earth's major physical divisions, the Pacific is outstanding by reason of its immensity. Its area of some 68 million square miles means that it includes about half the water surface of the globe and is larger than all land masses combined. Its over-all dimensions north-south and east-west are each about 10,000 miles.

The Pacific occupies an enclosed basin in the earth's crust. Within the basin is the maximum deep, nearly seven miles, on the eastern side of the Philippine island of Mindanao, but around its periphery even the apparent gaps between the major continental masses are bridged by islands and shallow crustal ridges. Young, actively growing mountains border the basin in Asia and the Americas. Shallow, narrow Bering Strait is simply a minor depression in the rim. Antarctica forms the southern boundary.

The Pacific World is fairly well centered in the basin, and leaves broad oceanic expanses around its margin, except in the zone of contact with the East Indies. However, so small is the proportion of land to water that there is little congestion among the islands composing the culture world. For example, 2,400 miles of open sea separate Honolulu from North America; the nearest reef to the south is some thousand miles; distances of similar magnitude isolate the Hawaiian group in other directions.

Literally tens of thousands of islands, only a fraction of which are officially named, dot the



Volcanic island and coral fringe

Pacific. Map inspection reveals an enormous disparity in size. On the one hand are tiny nameless reefs; on the other, continental Australia, and New Guinea, among all the world's islands second in size only to Greenland. Further inspection shows a broad segregation of small and larger islands. All of Polynesia except New Zealand, all of Micronesia, and the easternmost portion of Melanesia fall into a continuous region of small islands. The larger islands lie generally to the west.

Segregation of the islands by size is related to a difference of both character and geologic history. The smaller eastern islands are ancient volcanoes and are true oceanic islands. Much of their surface configuration is due to superficial coral growths. The larger western islands were built by forces of continental magnitude. Rather than what geologists consider true islands, they are parts of the continent of Asia and Australia, severed from mainlands by fragmentation and rising sea levels.

Present-day volcanic activity among the eastern islands is restricted to Hawaii. The volcanic cones

of most islands are so altered by erosion as hardly to be recognized as such. Original steep slopes have been cut by deep valleys and even bevelled to plateau-like eminences.

Warm clear waters combined with the shallow offshore depths around the islands provide ideal living conditions for a number of lime-secreting organisms. Corals furnish building material most abundantly; algae secrete the cement to bind it together. Both organisms live only in clear ocean water whose temperature does not fall below 68° F., and at optimum depths of 120 feet or less. Coral may build a narrow fringing reef around a volcanic island; with uplift the reef becomes a terrace or bench. Or, a fringing reef encircling a rocky island may become widely separated from it by a shallow lagoon if sea level rises or the entire island subsides. A slow rise of sea level may be accompanied by upward growth of the reef.

Of special interest is the *atoll*, an island ring of coral surrounding a shallow lagoon. These striking islands are generally believed to have been formed during the melting of Ice Age glaciers. Coral growth originally fringed volcanic islands, but the latter were slowly submerged beneath the



Atoll, mid-Pacific (U. S. Army photograph)

lagoonal waters within the upward-growing coral ring. Irrespective of origin, the coral atoll is superficially a product of its own materials and growth. It is never a perfect ring; it may be nothing more than a necklace of islets at high tide. The projecting surface is most continuous, highest, and widest on the windward side, and the outer beach is coarse coral rubble. On the lagoonal side of the atoll is a beach of finer sand, the product of mechanical and organic reduction of the coarse coral. Navigable openings to the lagoon, if any, are on the leeward shore of the island ring. Maximum elevations are the summits of coral-sand dunes, rising a few feet above sea level.

The large western islands are the products of diverse geologic forces. On them are high mountains resulting from folding, faulting, and volcanic activity. There are plateaus and plains composed of uplifted marine sediments, and there are plains formed by alluvial deposition, just as on continents. Though notable coral reefs are present, as in the case of the Great Barrier Reef of Australia, such features, so important in the smaller islands, are overshadowed by topographic forms of far greater magnitude and significance.

CLIMATES

In a world that is predominantly water, certain natural phenomena take on an importance that they lack on land—if indeed they exist at all away from the sea. Among these phenomena are ocean currents, water temperatures, tides, prevailing winds, and destructive cyclonic storms.

The Pacific World, with the unimportant exception of a few fringing islands and the important exception of New Zealand and part of Australia, lies within the tropics. Application of the ideal system of planetary atmospheric pressures and winds to the area would find a seasonally shifting belt of calms approximating the equator, and blowing toward it the northeast and southeast *trade winds*. The pattern is recognizable in the central and eastern Pacific. However, the equator of the winds fluctuates between 2° and 10° north of the geographical equator. In mid-Pacific the *doldrum* belt of calms is narrow or missing, so that the two trade winds meet directly in stormy confusion. It is a matter of importance both naturally and culturally that here in the middle and eastern Pacific the trade winds are dominant and reliable.

In the western Pacific, where the disturbing influence of large land masses is felt, the trade-wind system is upset. During winter of the northern hemisphere the outward push of air from Asia brings "northwest trades" or *monsoon* winds to

islands south of the equator. During northern summer the movement is reversed and the monsoon pushes in toward the Asiatic mass. The effect is to reinforce the southeast trades and extend them far north of the equator.

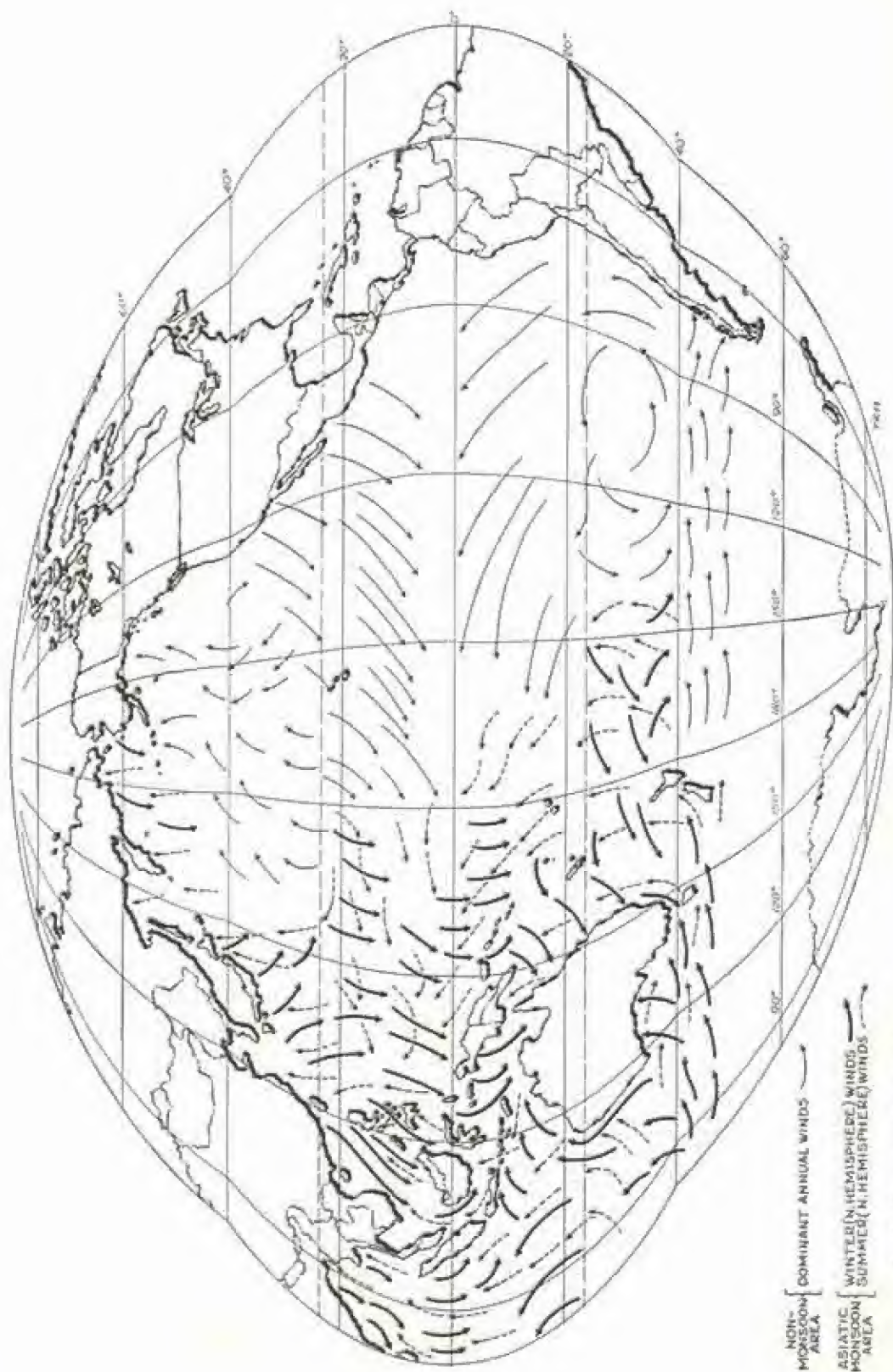
The destructive storms of the Pacific World are almost entirely *typhoons*, or tropical cyclones, similar to the hurricanes of the Gulf-Caribbean region of America. In structure the tropical cyclone is a gigantic whirl that may reach a diameter of 300 miles. Wind velocities of 200 miles an hour have been recorded within the whirl. The entire storm advances at a rate of ten to thirty miles an hour. Torrential rains are an invariable accompaniment.

Most tropical cyclones originate in low-latitude zones between the parallels of 8° and 15°, on both sides of the equator, and are summer phenomena of the respective hemispheres. The normal path of movement is arcuate, first westward and poleward, finally eastward and poleward.

The area of greatest typhoon frequency is north of the equator at the western end of the Pacific basin. An average of twenty storms a year form in the vicinity of the Caroline Islands and move northwesterly to strike the Philippines, the China coast, or Japan. An average of three tropical cyclones a year originate in the southwest Pacific, from Australia to Tahiti, and follow the customary course away from the tropics.

An equatorial belt extending to about 10° north and south is virtually free of destructive storms. In fact, nowhere in the Pacific World is the tropical cyclone the annual threat that it is to some adjacent regions. However, these storms can produce effects that are significant out of all proportion to their low frequency. Particularly on low atolls, one storm can obliterate human life and destroy habitability by removal of trees and reduction of island surface.

Less dramatic than tropical cyclones but more persistent in their effects on life are the permanent ocean currents. In the Pacific the gross pattern is composed of two gigantic whirls, a north Pacific whirl and a south Pacific whirl. The movement is westward near and parallel to the equator, so that the northern whirl moves clockwise, and the southern whirl, counterclockwise. In detail this broad scheme needs much revision. First, the equator of the currents lies north of the geographical equator, and approximates the equator of the winds. Further, there are two westward-setting equatorial currents separated by an eastward-moving counter current. Finally, the north Pacific adheres reasonably well to the simple dia-



Pacific Basin: wind systems

grammatic pattern of one great whirl but the south equatorial current is deflected into a number of largely independent whirls by the islands and changing winds of the southwest Pacific.

Ocean currents have general importance as conditioners of temperature, precipitation, fog, and marine life in higher latitudes. In the Pacific World, with the exception of Australia, currents produce no striking results in these general respects. The currents are warm in a region that is climatically warm. Lacking are the contrasts which elsewhere effect abnormalities of temperature, precipitation, or marine life. In one respect the currents are significant, and that is as a force that has aided or retarded the diffusion of flora, fauna, and man himself.

Tides are another matter of importance in sea-conditioned lands. Among the smaller islands of the Pacific the tidal range is slight, rarely exceeding four feet. In the larger continental islands the range is much greater, reaching over 40 feet in Australia. Nevertheless, even slight tidal range has significance on the low islands. Ebb tide exposes shellfish and other edible forms of marine life. It may make accessible by land, islets that are isolated during flood tide. High tide may provide the depth of water necessary to sail over a reef.

More important are a number of phenomena popularly referred to as tidal, even though they are not caused by lunar pull and their occurrence is irregular. Wind tides or swells of considerable magnitude accompany tropical cyclones. Though wind tides often presage the approach of a storm, they may appear a thousand miles removed from the winds that cause them, with a height sufficient to wash completely over an atoll. Similar in effect are the sea-waves accompanying earthquakes, caused by displacements of the earth's crust on the floor of the sea. Destructive effects of such waves are publicized for densely populated areas. They are equally severe on sparsely peopled atolls. In 1946 an earthquake sea-wave originating near the Alaska coast swept completely over an occupied island of the Hawaiian group. There may be some warning of a wind-caused wave: there is none of a rapidly progressing earthquake sea-wave. Of still different origin and nature are tide rips and whirls. These rips and whirls, exceedingly dangerous to small vessels, are the result of conflicting currents and winds. Often their occurrence is unpredictable and their origin inexplicable.

One of the more conventional aspects of the natural setting, climate, needs less than usual discussion because it shows less than normal variation. Low-latitude position plus dominance of sea over land make for a uniformity of atmospheric conditions. Only Australia has climatic variation

on a continental scale. Big New Zealand has a remarkably equable climate, despite its extra-tropical location. Among the tropical islands local variations of climate reflect elevation, size, and direction of dominant winds.

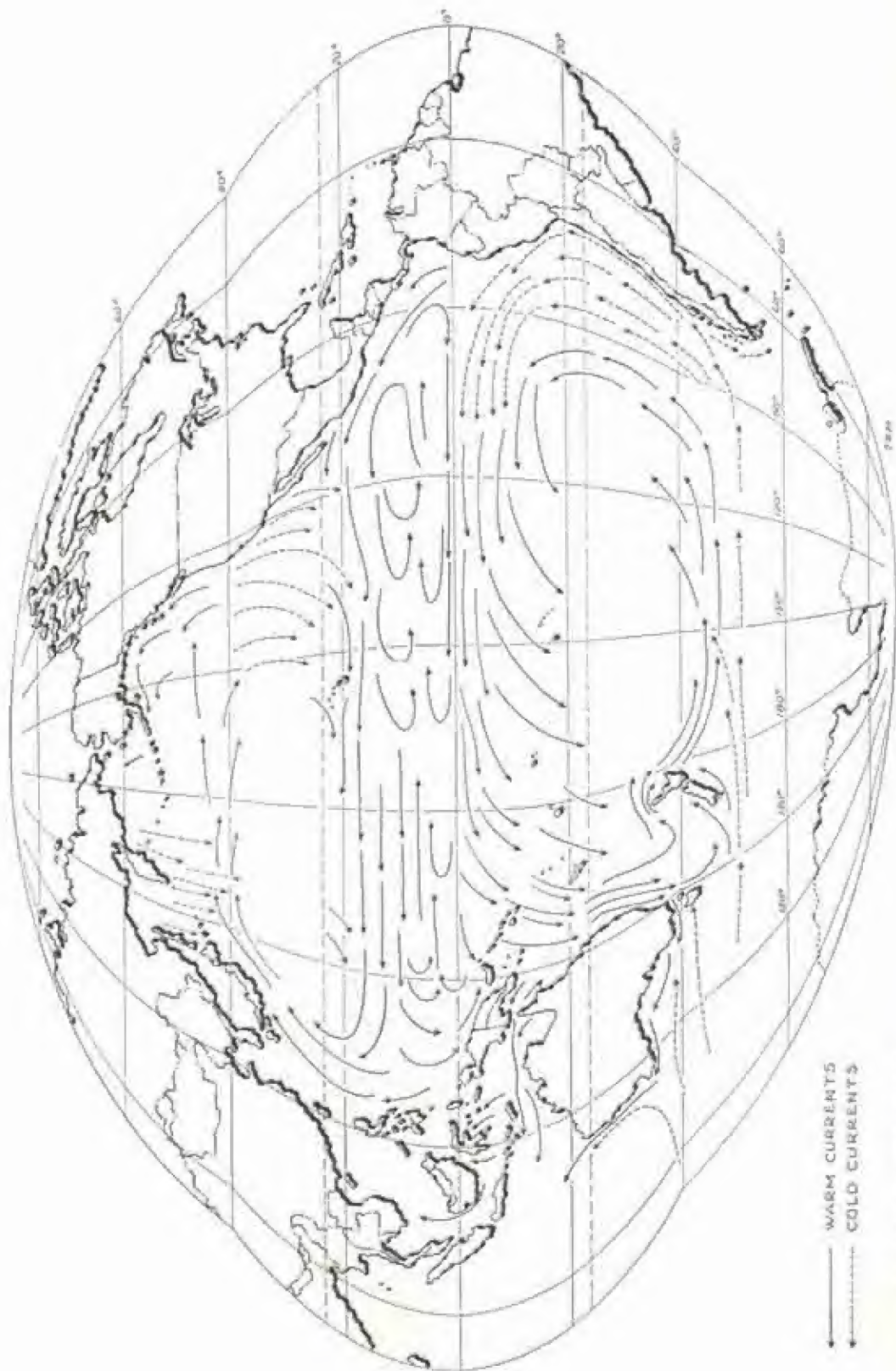
Because most of the Pacific World lies in the tropics, temperatures are relatively high and show little fluctuation. Polar air never intrudes with such force as to introduce cold weather. On the other hand, truly high temperatures are restricted to interior or leeward locations on the larger islands. In New Guinea the mountains are high enough to bring striking temperature modifications. As a generalization, the Pacific World has an even temperature regime, with a growing season uninterrupted by cold; cool weather is related to elevation rather than to a season of the year.

Precipitation is in large part a matter of exposure to prevailing winds. A high windward exposure on the island of Maui, Hawaii, receives an average of 362 inches of rain annually; a leeward location on the same island, 15 inches. Port Moresby, New Guinea, has annual precipitation of 32 inches; among the mountain peaks 75 miles away it is 232 inches. Low coral islands and reefs may remain quite rainless, even though subject to constant winds. But there are other mechanisms to bring rain. Islands of even moderate size are cause for differential heating and the development of convectional showers. Frontal disturbances between contrasted air-masses bring winter precipitation to leeward positions in Hawaii. And tropical cyclones, often of less than destructive magnitude, bring rain even to featureless atolls. In general, then, the Pacific World receives adequate to abundant precipitation, with the local variations outlined above, and there is no marked seasonal dominance.

To these remarks regarding climate, Australia and New Zealand provide numerous exceptions. They will be discussed later.

Flora and fauna of the Pacific World have an importance that is both academic and practical. In the first place, both plants and animals in many areas are distinct from those associated with Asia. And secondly, flora and fauna play nicely complementary parts in aboriginal economy. Finally, many of the plants and animals regarded as native to the islands were actually carried there by the migrating peoples who populated them.

About the middle of the nineteenth century the English scientist, Wallace, after extensive study in the East Indies, noted a striking geographical segregation of plant and animal life into "two



groups as widely divergent as in any two parts of the world." To separate them he drew the famous Wallace's Line between Lombok, Celebes, and Halmahera on the east and Bali, Borneo, and the Philippines on the west. The life forms west of the line were referred to as Asiatic, those east of the line as Australian. The faunal and floral differences were interpreted to mean a separation between the two continental masses at an early date in the history of life. It was also suggested that the islands had been connected by land bridges as late as the Pleistocene ice age, that is, New Guinea was part of Australia, and the East Indies part of Asia.

Further study has largely corroborated Wallace's findings. Asiatic mammals found on the East Indies include the tiger, rhinoceros, wild buffalo, deer, and wild pig. In New Guinea the only mammals certainly indigenous are marsupials or pouched mammals, and the primitive *monotremes*, who both lay eggs and suckle their young. Wild pigs and mice may well have been introduced by man. New Guinea is the exclusive natural habitat of the bird of paradise. It has few poisonous snakes, and they are non-Asiatic. Eucalyptus and nettle trees belong to the strange flora found east of the line. On the other hand, the land mollusks of New Guinea are Asiatic species.

Wallace's Line does not sharply divide Asiatic from Australian species. Celebes, which lies east of the line, has a largely Asiatic fauna combined with small marsupials and eucalyptus trees that are Australian. A zone of transition extends eastward to what has been called Weber's Line, drawn east of Timor and west of Halmahera.

Oceanic islands, that is, those never part of a continental land mass, occupy the greater area of the Pacific World. They include all of Polynesia, even New Zealand; all of Micronesia; and the Melanesian islands east of New Guinea. The flora of these islands had to come from continental sources, whether through natural or human agencies. Imperfect as knowledge is regarding the sequence and manner of spread of plants and animals to the oceanic islands, two generalizations seem safe: the number of species declines enormously eastward; their sources, with exceptions for Hawaii and Easter Island, are New Guinea and the East Indies.

The source region is outstanding with respect to both luxuriance and variety of plant growth. New Guinea combines Australian species with both old and recent importations from the Indies. Tropical rain forests dominate the lower elevations. Growing on beaches are the coconut palm and pandanus or screw pine; mangrove outlines

river mouths; nipa palms grow in brackish swamps; sago palms in fresh swamps. Bamboo thickets spring up in forest clearings. Bananas grow wild in colonies on more-open hillsides, and orchids and ferns do best in the same environment.

The fauna, especially the Asiatic assemblage, is equally abundant and varied. Birds, mammals, reptiles, amphibians, and insects are all abundantly represented by wild forms. More important, the source area provided domesticated animals that could be transported great distances in small boats; the dog, fowl, and pig.

Wind, currents, and birds were the natural agencies carrying life to the oceanic islands. Perhaps pigs swam the narrow Pleistocene channel to New Guinea. Rafts of debris might have carried small animals to more distant islands. Coconuts and pandanus fruit could have floated to the beaches they prefer as their habitat. Cyclonic winds could blow insects, land birds, and bats to the safety of a distant archipelago. Migratory sea birds transported seeds in the course of routine flights.

It is impossible to distinguish clearly the results of haphazard spread from later diffusion by man. It seems likely that the coconut and pandanus were widely distributed prior to man's coming, even to the low coral atolls unfit for most plant growth. The most distant volcanic islands appear to have had a luxuriant, if specifically limited, plant cover. Here birds seem the most probable carriers, with drift by currents a secondary agency.

Aside from insects, fauna fared less well than flora. The only mammals reaching many mid-ocean islands were bats. Land birds were few. The fauna on Samoa includes bats, rats, four



Contact of Asian and Australian life zones

species of harmless snakes, lizards, and the ground pigeon. Of these, rats and lizards are thought to have been introduced by man. Occasionally fate was such as to bring to a remote island a species that thrived in a noncompetitive environment. A few experienced evolutionary change to survive as something unique in all the world. Such was the now-extinct *moa*, a giant, flightless bird of New Zealand.

Man added to the list of plants and animals by design and by accident. Plantings extended the natural limits of the coconut palm. Polynesians brought taro, yams, breadfruit, bananas, sugar cane, and possibly a sweet potato to the mid-Pacific islands. They established the dog, fowl, and pig. Presumably by accident they introduced rats, mice, and lizards, who had travelled as stow-aways. To this pre-European list have been added so many plants and animals subsequently as to cloud the picture. From America have come

papaya, guava, arrowroot, cassava, tobacco, and the pineapple, to mention a few of the more thoroughly integrated. The list of recent introductions is not confined to the useful and acceptable. In Hawaii, to cite a single example, ornamental lantana from America provides food for a starling from the East Indies. The latter has distributed undigested seeds so diligently as to create dense and useless growths throughout the islands. And, there have been frequent attempts to introduce poisonous snakes into the Eden that is Polynesia!

Less confined in their movements by vast expanses of open water are the sea birds. Albatrosses, petrels, and terns may be encountered anywhere in the Pacific. Snipes, sandpipers, and other shore birds nest on the northern margins of the basin and winter in the islands. Gulls, on the other hand, remain close to land and are never found in mid-ocean. But, of all the sea birds the golden plover is the most striking in the present connection. The plover nests in the Bering Sea region. In the fall it migrates in mass flight through Hawaii, Palmyra, and the Marquesas to the Tuamotus. With the coming of northern spring the movement is reversed. Students of the matter believe that the regular flights of the golden plover guided the Polynesians on their journeys between Tahiti and Hawaii.

The tropical seas of the Pacific support a tremendous variety of life, even if total amount is less than in colder waters. The fisheries are significant, not as resources to be exploited commercially, but rather as bases of local subsistence. In this respect they are more than adequate. Number of species and bulk are both at a maximum in the East Indies. Both decline gradually eastward. Again evidence points to a western



Coconut palms, Canton Island
(U. S. Army photograph)

(East Indian) origin of species diffused among the oceanic islands.

The islands and coral reefs about them are foci of sea-life concentration. Among the reefs and on the sandy bottoms are many varieties of local fish. They are invaded by predatory sharks and barracudas. In the open sea are swift-moving fish, such as the tarpon. Also among the reefs and in the lagoons are edible snails, clams, squids, eels, crabs, crayfish, and the oyster-like clams that carry gem pearls. Sea turtles come to the beaches to deposit their eggs, and delectable palolo worms swarm annually in the shallow waters.

A number of species of shark occur, many of them harmless vegetarians. The tiger shark does occasionally take a human life, but he is generally more sinned against than sinning. It is a favorite sport to kill him with a knife in combat; and sharks are taken regularly for their excellent flesh.

AUSTRALIA

With its nearly 3 million square miles, Australia may be considered the world's largest island or the least of the seven continents. In either event, Australia is large enough to have a continental variety of climates; and it is topographically no simpler than Africa.

The core of old rocks about which the continent is built rises rather steeply from the floor of the sea, except for a hundred-foot-deep spur that connects it with New Guinea and another spur, 200 feet deep, extending to Tasmania. The continental outline is rather regular, but widespread coastal drowning provides a number of good harbors. On the other hand, regular shores along the Australian Bight are the result of an abundance of beach-forming sand.

Australia's relief pattern suggests a huge platter, rimmed about the edge. In detail the western three quarters of the continent is a plateau, with elevations ranging from 600 to 1,500 feet. Parts of the plateau rise to 3,000 and 4,000 feet to form isolated interior ranges, and also the western rim of the platter. The rocks are gen-

erally old and highly altered; to past geologic events they owe extensive gold deposits.

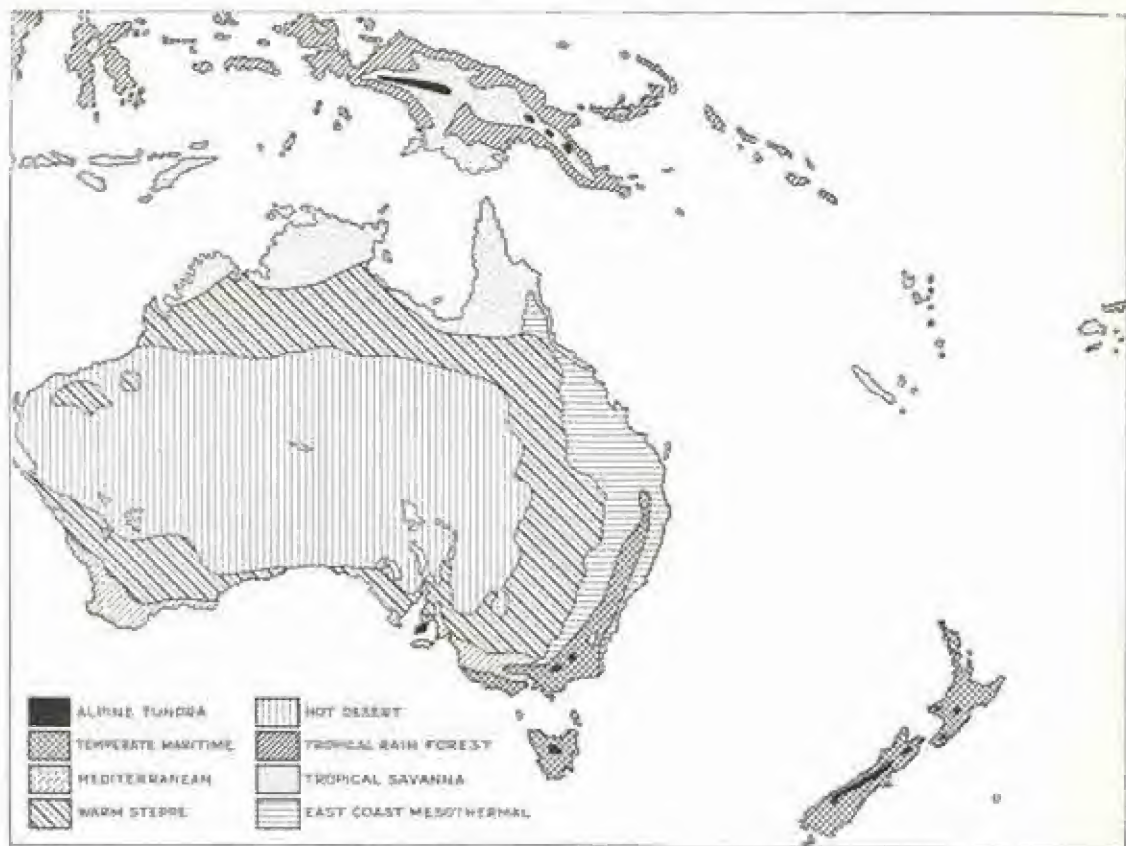
Concentrated mainly to the southeast of the plateau is the second of the physiographic regions, the interior basin. Most of its surface is less than 500 feet in elevation. A part of it has interior drainage to salty Lake Eyre. A segment about equal in size is drained southward to the sea by Australia's only important river system, the Murray-Darling. The sedimentary rocks of the northern part of the basin provide artesian water to a land climatically dry. The Flinders Range, which separates the Lake Eyre basin from Murray-Darling drainage, is composed of old rocks that are a source of copper.

The third physiographic region is the eastern highlands, a thin band of mountains rimming the eastern margin of the continent. To the north the mountains are low and fragmentary, averaging considerably less than 2,000 feet in elevation. In the south the Great Dividing Range is higher, Mt. Kosciusko, Australia's tallest peak, reaching 7,328 feet. The rock composition of the mountains is varied. A granitic core is flanked by metalliferous altered sediments and less-altered coal measures.

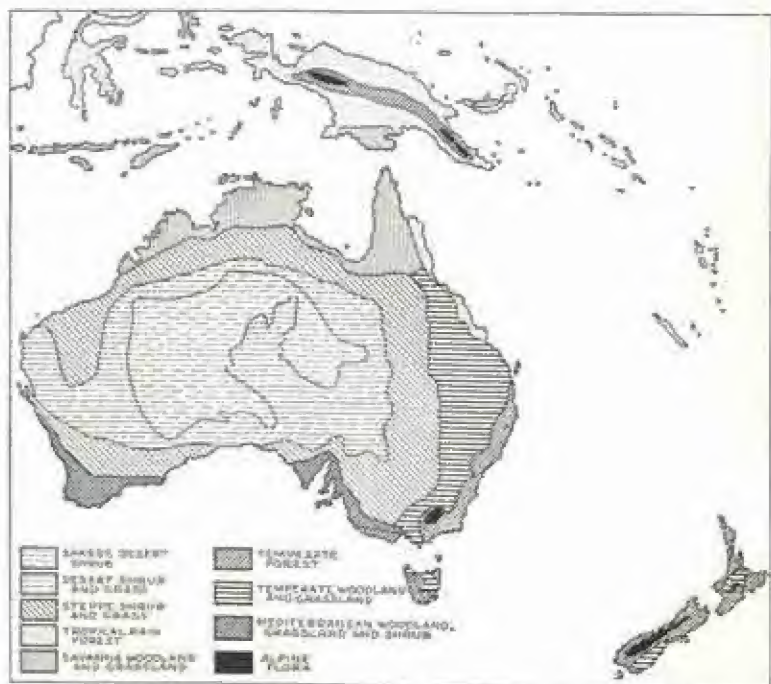
Hardly to be considered a physiographic region, but nevertheless an important and significant feature is the Great Barrier Reef. The Reef, really an aggregate of innumerable coral reefs, lies on the edge of the continental shelf and parallels the east coast for some 1,250 miles north from latitude 24° S. Though much of it is awash at high tide, the 35-mile-wide reef gives a measure of protection to the lagoon lying between it and the mainland. The lagoon has an average width of about thirty miles and is from 100 to 400 feet



Australia: relief



Australia: climates



Australia: vegetation

deep. It has long been used by both coastwise and deep-water shipping, though in the days of sailing vessels it was customary to anchor each night rather than risk the complexity of shoals lying between outer reef and mainland.

Australia's climatic variety is suggested by the range of annual precipitation, from over eighty to less than six inches; and annual temperatures, from 85° F. to less than 50°. Killing frosts are so few as to be of slight concern, yet permanent snow is found in highland Tasmania. Atmospheric conditions are variously affected by both trade and westerly winds, the monsoon, and polar air from Antarctica.

In terms of customary climatic divisions the striking fact is the dominance of arid climates. With the exception of a bounding margin the whole continent is classed as steppe or desert. And even this humid margin is broken by arid stretches along the Great Australian Bight, the Gulf of Carpentaria, and the west coast. The desert is innermost, and it is surrounded by transitional steppe except at the west where desert reaches the coast. The desert is estimated to be 1.1 million square miles in extent, or more than a third of the total area of the continent.

Most of the Australian desert is *reg*, not unlike the vast gravel surfaces of the Sahara. There are also *hammada*, thinly mantled or barren bedrock; *erg*, or dune-covered areas; and *wadies*, trench-like valleys, dry except for rare occasions. Xerophytic acacias are the dominant plants in the scanty vegetation cover, with restricted appearance of emu bush, spinifex grasses, and scattered eucalypts. Folk classification based on utility distinguishes two deserts: the larger Western Desert and the eastern Arunta Desert. These two areas, comprising some 500,000 square miles or half the climatic-desert total, have extensive fixed-dune surfaces, are streamless, and so poor in vegetational resources as to lack European inhabitants.

Steppe fills the gap to humid climates, and in so doing occupies most of the area remaining inside the coastal rim. The sharp desert landscape gives way to softer profiles; and the acacias, eucalypts, and salt bush yield to a solid sea of blue grass on the moister margins.

The northern humid continental rim is tropical savanna. What is classed as subtropical savanna adjoins the tropical savanna and occupies the eastern coastal margin from latitude 20° S. to 25° S. Rainfall attains its maximum during the southern summer; it varies in amount from 30 inches in the west to over 80 inches on the northeast coast. The outermost savanna vegetation zone is open eucalypt forest. Woodland gives way to grassland inland. On the east coast of

Cape York Peninsula there is sufficient rainfall to support true rain forest.

An east-coast mesothermal or Carolina-type climate extends southward from 16° S. approximately to latitude 37° S. Precipitation ranges from 30 to 60 inches, without marked dry season. Winters are mild but are definitely cooler than summer. The area contains a valuable temperate forest composed in the main of numerous species of eucalypt.

Following the mountains south from Brisbane to the southeastern corner of the continent is a temperate maritime climate of the type appropriately qualified as west-coast for the Americas and Eurasia. Seasonal temperatures are slightly lower than in the east-coast mesothermal. Precipitation is between 30 and 40 inches, without pronounced dry season. Part of the area is humid grassland, but its temperate forest includes Australia's finest eucalypts, claimed by partisans to be the world's tallest trees.

The two additional humid regions, one east and one west of the Great Australian Bight, are both Mediterranean in climate. Rainfall of from 15 to 40 inches comes during the southern winter, and is combined with moderate summers and mild winters in a highly livable climate. The native vegetation shows a wide range from heavy forest through woodland and grassland to maquis or chaparral.

The unusual character of the Australian floral and faunal assemblages is epitomized by the *koala* or "teddy bear" feeding on the leaves of the eucalyptus tree. The strange little koala is not related to the bear at all, but disregard of the facts of natural history is characteristic of folk nomenclature when it applies European terms to faintest resemblances among unfamiliar animals and plants.

The trees are rich as to species but poor in genera. Two genera, eucalypt and acacia, are each represented by nearly 400 species. Together they constitute the great bulk of Australian trees. Individual species of eucalypt are called popularly coolibah, ironbark, mallee, and salmon gum. Of acacia there are brigalow and mulga. In limited tropical areas appear the familiar bamboo and pandanus. So-called pines, cedars, and beeches are distantly if at all related to Old World species of the same name.

The fauna is similarly limited as to kind. Marsupials and monotremes dominate the mammals, and for most of them are names associated only with Australia: kangaroo, wallaby, duck-billed platypus, and spiny anteater. Of other mammals,

the "wild" buffalo was introduced by man, and the same is thought to be true of the wild dog or *dingo*. Birds are numerous and varied, particularly migratory waterfowl. Reptiles are represented by crocodiles, lizards, snakes, and turtles.

The natural balance established among the native flora and fauna was inevitably upset by Europeans. Two importations, the rabbit and prickly pear cactus, are notable examples. The rabbit spread widely and increased to become a menace to grazing resources. Expensive fencing has not controlled him, nor has the exploitation of his meat and hides. Cactus spread in solid stands to the detriment of both agriculture and grazing. The fortunate finding of an insect destructive to prickly pear stopped its spread and made possible the reclamation of lost acreage.

TASMANIA

Tasmania, with its 26 thousand square miles, is a small, detached fragment of Australia. Structurally, climatically, and in other natural respects it is a southward extension of the mainland from which it is separated by 150-mile-wide Bass Strait.

Like the related part of the continent, Tasmania is mountainous. To south and west are scarp-separated block highlands, with Cradle Mt. rising to 5,069 feet from a general level of 4,000 feet. Beyond a central plateau lie northeastern highlands. The latter contain Ben Lomond, the island's highest peak at 5,160 feet. There are northern coastal lowlands, minor interior lowlands, and other lowlands along the eastern and southeastern shores.

The mountains are incised by deep canyons, and exhibit sharp crests, lakes, and other evidences of past glaciation. Waterpower resources are great in proportion to the size of the island. Geologic variety is indicated by commercial deposits of gold, coal, and other minerals.

Insularity is responsible for a remarkably equable climate, the annual temperature range being only 10° to 20° F. Prevailing westerly winds reinforced by invasions of polar air bring rainfall of well over 100 inches per year to westward exposures. Leeward locations receive as little as 18 inches. The wetter slopes support a very dense forest growth made up mainly of gums, ferns, and beeches. Forest gives way to park landscape on rain-shadow surfaces.

NEW ZEALAND

New Zealand's slightly over 100 thousand square miles are split into two major islands,

North and South, of comparable size, and a number of smaller ones. The two larger islands are very different from each other and quite distinct from Australia, from which they are separated by a thousand miles of deep open sea.

The broad portion of attenuated North Island is predominantly mountainous. Ranges occupy its center; to the west are conspicuous active volcanoes. The principal lowlands occupy the neck connecting body and head of the island.

The crest of the long, regular range composing most of South Island lies to the west, restricting major lowlands to the east coast. A number of peaks are over a mile high; the tallest, Mt. Cook, reaches 12,345 feet. In striking contrast to the active volcanoes and thermal springs of North Island is still-active glaciation. Lakes, waterfalls, cirques, matterhorn peaks, and even fiords on the southwest coast make for scenic grandeur but obstruct access to a variety of mineral deposits that include gold, coal, and tungsten.

New Zealand is cool for the average of its latitude. The northernmost cape of North Island reaches 34° 30' S., yet the whole country falls in the climatic category of temperate maritime. As in Tasmania, rainfall, particularly on the western flank of the South Island mountains, reaches a high annual figure. Precipitation is well distributed seasonally and is normally adequate, even in leeward locations.

South Island in particular supports a dense and excellent forest stand, made up in the main of indigenous plant species. Even the most-common Australian trees are missing, but there are conifers showing Asiatic affiliations and hardwoods related to South American species.

New Zealand fauna is rich in birds, many of them flightless varieties found nowhere else. Bats are native, but indigenous land mammals and snakes are lacking.

NEW GUINEA

New Guinea, westernmost of the larger islands of the Pacific World, has an area of 300 thousand square miles, or slightly less than combined Texas and Louisiana. The island is large enough to possess striking variety of natural conditions.

A central mountain range runs almost the entire island length of 1,500 miles. A considerable proportion of the crest lies above 12,000 feet. Mt. Idenburg has an elevation of 15,150 feet, and Mt. Carstensz, the highest peak, 16,400 feet. Since the line of permanent snow stands at 14,600 feet, New Guinea has a number of snow-clad peaks within a few degrees of the equator. An ice-capped crest is bounded by 10-thousand-foot declivities both north and south.

North of the central mountain chain is a plateau, deeply cut by major streams, and beyond is a coast range with peaks reaching 6,000 to 10,000 feet. Recent uplift of the coast range is indicated by the presence of coral terraces at elevations of a mile above sea level.

On the south side of the island are the principal lowlands. In large part they are alluvial plains. Rivers are numerous, long, and deep; in instances they are navigable by ocean-going steamers for a matter of 200 miles inland.

New Guinea is properly constructed and situated to benefit from a number of moisture-bringing winds. During northern summer the southeast

trades strike south slopes. During southern summer northwest and northeast winds hit north exposures. Total rainfall ranges from great to moderate, and no spot approaches true climatic aridity. Abundant precipitation combined with an average annual temperature of over 80° F. for the lowlands produces a hothouse climate that carries forest to the 10,500-foot cold tree line; and it nurtures the general lushness of life referred to in connection with the diffusion of plants and animals to the oceanic islands lying to the eastward.

49: Native Peoples

The biological history of the peoples of the Pacific World begins in Asia. Just as plants and animals spread from Asia eastward and southward through the islands, so did man. With Java a possible birthplace of mankind, and with the racial diversity involved in Asia's long history, it is not surprising that the Pacific World shows multiple effects of proximity. The three great races, Caucasoid, Negroid, and Mongoloid, and as well, archaic traits from a far older people, are all represented among the pre-European inhabitants of the islands.

The following table is a simple outline of the racial composition of the Pacific peoples:

Table 29 Racial classification of the Pacific World (after Hooton)

Primary Race: Negroid
Primary Subrace
Negrito
Composite Race (predominantly Negroid): Melanesian-Papuan
Secondary Subraces
Papuan
Melanesian
Composite Race (predominantly Negroid): Tasmanian
Composite Race (predominantly White): Australian
Composite Race (predominantly White): Polynesian
Composite Race (predominantly Mongoloid): Indonesian-Malay
Secondary Subraces
Malay-Mongoloid
Indonesian

Negroid and predominantly Negroid peoples occupy Melanesia and were the aborigines of Tasmania. What are regarded as the purest racially of the Oceanic Negroids, the Negritos or Pygmies, are restricted to the interior mountains of New Guinea. The New Guinea Negritos differ in no important respect from other Negroid Pygmies living in Malaysia and central Africa. The similarities suggest a common origin for all Negritos and a once-continuous distribution from Africa to New Guinea.

In practice, Papuans are distinguished from Melanesians largely on a linguistic basis. The former speak a great variety of tongues, seemingly unrelated among themselves or to any other, while Melanesians belong to the widespread Malayo-Polynesian linguistic family. Both are regarded racially as mixtures between Negritos and various non-Negroid stocks.

The Papuan is described as being more Negroid than the Melanesian. He would be recognized as Negroid by those familiar with Africans, but the careful observer would note hair more abundant and less-tightly curled, lips less thick, a nose often hooked, and additionally, archaic or primitive traits such as those described below for Australians. Papuans are largely restricted to western and southeastern New Guinea.

Among the Melanesians the archaic physical traits rarely appear. Their hair is often curly or even wavy rather than frizzly; this and other



Australian aborigine

From E. A. Hooton, *Up from the Ape*, Revised Edition. Copyright 1946 by The Macmillan Company

racial characteristics suggest Polynesian or Indonesian admixture. The Melanesians occupy northern and northeastern New Guinea and the lesser islands east to Fiji.

The Australian aborigine shows obvious Caucasoid characteristics in wavy to straight head hair and abundant body and facial hair. Archaic traits are illustrated by a depressed nasal root, prominent brow ridges, weak chin, and low forehead. Similar primitive traits are exhibited by the Ainu of Japan and the Vedda of Ceylon. The native tongues of Australia have no known relationship to those of the outside world.

The native Tasmanians are regarded as having been a mixture of Negrito and Australian, with the traits of the former dominant. This extinct people were once the exclusive inhabitants of the island of Tasmania. Their language is presumably unrelated to any other.

The Polynesians are a big, broad-headed people having wavy hair and light-brown skins. Racially they are primarily Caucasoid Mediterranean, with some Mongoloid and Negroid admixture. The Polynesians inhabit the great triangle of islands whose vertices are Hawaii, Easter Island, and New Zealand. They speak a language that varies but slightly from one geographical extremity to the others; it belongs to the Malayo-Polynesian family, and is called Sawaori or Mahori.

One common term, Micronesian, does not appear in the table on racial classification. The inhabitants of Micronesia do not constitute a distinct racial group. On the border with Polynesia they are similar to Polynesians. Adjacent to Melanesia they show a Negroid strain. Where Micronesia adjoins the Philippines the Indonesian subrace is dominant. Indonesians are less Mongoloid and more Caucasoid than are the neighboring Malay-Mongoloids. Malayo-Polynesian tongues are spoken throughout Micronesia, the languages being grouped as Micronesian or Tarapon.

Asia was the reservoir big enough to furnish the varied racial elements contributing to the

primitive peopling of the Pacific World. While the evidence is fragmentary and the record dim, it appears that the Negritos were the first recognizable group to invade the islands. They occupied New Guinea and pushed southward into Australia and Tasmania.

Next in order of arrival were the archaic Caucasoid Australians. They passed through New Guinea and provided the element that in combination with Negritos eventually gave rise to the Papuans. In Australia the primitive Caucasoids absorbed part of the older Negroid peoples and confined a small group of somewhat mixed Negritos to Tasmania.

The Polynesian settlement of the oceanic islands came long after the movements enumerated above. About the time of Christ the Polynesians began sailing eastward out of the East Indies, already a people mixed approximately to their present racial proportions. These intrepid sailors ventured into an unknown, unpopulated world that included all of Polynesia, and probably all of Micronesia and the lesser islands of Melanesia.

The Polynesian route eastward is strongly debated. Some evidence favors a course through Micronesia, and some suggests a route through Melanesian New Guinea. In any event, the center of the Polynesian world was established in Tahiti, perhaps by A.D. 700. From this nucleus colonists reached the nearer archipelagos within a few hundred years. Hawaii is thought to have been settled from Tahiti about the middle of the thirteenth century. New Zealand around the middle of the fourteenth, and Easter Island about the same time. No habitable island within the Polynesian triangle was missed. Social and ceremonial visits kept the long sea routes among the islands open through the fourteenth century. After that voyages were uncommon and only oral tradition preserved the record of earlier journeys.

Meanwhile, Micronesia and eastern Melanesia



Polynesian

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494 Pacific World: pre-European realms and Polynesian migrations (routes after Weckler)

were populated. While eastern Micronesia remained largely similar to Polynesia, to western Micronesia came Indonesian and Malay refugees or adventurers to confuse the racial and cultural unity of the realm. Similarly, the common boundary of Melanesia and Polynesia became a zone of racial and cultural mixture. Melanesian peoples and practices moved eastward, while some Polynesians returned westward to visit or settle. Even today there are small islands as far west as the Solomons whose inhabitants are Polynesian, racially and culturally.

NATIVE CULTURES

The usual time plane of reference for the description of preliterate cultures is established by the date of first contacts with civilization. The objective is to picture the way of life before it was altered by sharp collision with foreign customs and practices. The accuracy of reconstruction depends largely upon the quality of the written records kept by early explorers. Oral tradition of the native peoples becomes less trustworthy with the lapse of time. They may come to believe sincerely that recently acquired traits were commonplace among their ancient forbears.

Europeans got to the Pacific World in the sixteenth century. Written accounts of the early contacts are unsystematic and generally unsatisfactory. Important contributions to native ways, such as the introduction of some new plant, went unrecorded. The student of the Pacific peoples has had to use every bit of evidence and direction of approach, not only to distinguish original from borrowed, but even to find out commonplace facts regarding daily life. Though much remains to be done and there are many unanswered questions, there is agreement with respect to the major culture divisions.

The basis of division into Polynesia, Melanesia, Micronesia, and Australia is a compound of biologic, linguistic, cultural, and areal considerations. Geographic interest centers upon the material aspects of life: villages, economy, communications, and distribution of population. These phases of aboriginal culture are stressed in the following descriptions.

Polynesia. Two of the 5,000-mile legs of the Polynesian triangle of mid-Pacific islands run straight through the open sea, from Hawaii to Easter Island, and from the latter to New Zealand. The third extends about north from New Zealand, to throw the Fiji Islands just outside Polynesia. The line then bends sharply westward to include the Ellice Islands, leaves the Gilberts with Micronesia, and continues northeasterly to Hawaii.

The total land area of Polynesia, "many islands," is a bit less than 125,000 square miles, or about the size of New Mexico. Excluding New Zealand, the area is only some 10,000 square miles. An estimate of 1.1 millions for the sixteenth-century native population allows an average density for the land area of nine persons per square mile. This average figure has little significance. Of about a dozen groups of inhabited islands, Hawaii, Samoa, the Societies, the Marquesas, and New Zealand were the most populous. An independent estimate for Hawaii alone is 200,000, which seems somewhat too high if the total for all Polynesia was only slightly over a million.

In short, some islands and island groups had greater densities than others, so that size alone is not the key to the total of pre-European inhabitants on every island. Trial and error or sound judgment, and not ignorance of their existence, dictated that some land areas were unpopulated when first seen by Europeans. Evidence in the form of plants that cannot diffuse naturally, bananas and breadfruit, for example, and man-built stone structures indicates that the Polynesians were familiar with even the smallest islands. The Phoenix group, Pitcairn, and the equatorial islands south of Hawaii were once occupied, then abandoned. There were islands such as Midway that were never permanently occupied.

Population-density differences are partially explained by the variable nature of the islands themselves. A stone-age culture involving both fishing and agriculture found a more-favorable habitat on volcanic islands than it did on coral atolls. Both might provide excellent fishing, but the higher volcanic islands supplied fresh water, good agricultural soils, stone for tools, useful wild plants and trees, forage for pigs, and abundant wild fowl, all restricted or lacking entirely on coral atolls.

On dissected rocky islands dwellings clustered in the valleys, where fresh water and arable ground were available. On atolls the favored site was the inner or lagoonal shore. Individual habitations were dispersed, or nucleated in strongly defended villages, depending upon the nature of the relationship between neighboring peoples. The houses were exceedingly well and expertly made thatched structures, in eastern Polynesia rectangular in form, and in western Polynesia, oval shaped. Of more permanent construction were the stone platforms and pyramids of central and eastern Polynesia, which served as altars, tombs, and bases for temples, unimportant in numbers but

significant as revealing knowledge of a special technique.

Near the houses were fields or patches of taro, yams, sugar cane, and sweet potatoes; and groves of coconut, banana, and breadfruit trees. Pigs were often fattened in pens, while dogs and fowls were free to forage. From wild or cultivated plants and trees came kava root for making a ceremonial drink, mulberry bark to be pounded into tapa cloth, and various fibers to weave into fine mats. Knives were made of bamboo or stone, and also of stone was the blade of a wood-working adze. The earth-oven made up in part for the absence of pottery. This method of cooking involved lining an excavation with hot rocks, filling with vegetables, meat, and fish, covering with leaves and earth, and permitting the food to steam for several hours.

The sea held a place of equal importance with land as a scene of activities. Most modern methods of fishing have their Polynesian counterparts. Traps, baskets, weirs, spears, nets, rods and lines, trolling, and poisons were all employed to take a variety of water foods that ranged from reef shellfish to deep-sea turpon. Fishing meant boats, the family-size outrigger dugout, and the built-up outrigger boat for use in the open sea.

Even the open-water fishing boats did not approach in size or seaworthiness the vessels used for long inter-archipelago voyages. The biggest of the latter reached lengths up to 100 feet and could carry as many as sixty passengers. They were constructed on a keel hewed out of a single log. The sides were built up with carefully fitted planks sewed fast with coconut fiber. A smaller boat of the same type served as the steadying outrigger. A platform between the two hulls was sheltered by a thatched housing. Sails and paddles propelled the vessel. Coconuts, water in bamboo tubes, pandanus flour, dried fish, cooked breadfruit, and even facilities for cooking aboard made possible voyages of 2,500 miles, taking three to four weeks to complete.

The very building of such capable vessels as well as the thorough preparations prove that the Polynesians intentionally set out on long voyages for the purpose of exploration and settlement. Their thorough diffusion through the mid-Pacific was no matter of storm-blown fishermen. The lore of Polynesian navigation is largely lost. There are hints regarding its elaborate nature in profound knowledge of the patterns of stars, tides, currents, winds, weather, and the habits of different birds. Even the present-day Polynesian can detect an unseen atoll by its green reflection on

the clouds, and get directions to land from drift-wood.

On the margins of Polynesia there developed modifications of the central culture pattern. Isolation and different local resources brought gradual change. Lower temperatures and an abundance of wood encouraged the New Zealand Maori to build wooden houses, bring wood carving to a high art, substitute woven cloth for tapa from the missing tropical mulberry, dispense with outriggers on broad-beamed dugouts, and emphasize sweet potatoes rather than more-tropical crops. In Easter Island the scarcity of a familiar medium, wood, permitted the native Polynesians to work so strikingly in stone as to create the myth of a "mystery of Easter Island."

Materially life would seem to have been quite satisfactory in Polynesia, but it was nevertheless vulnerable to the attack of European culture. However, the use of the past tense in describing Polynesian material culture is not to imply that it is completely gone. The great ocean-going vessels have not been built for many years; many native arts and crafts are rarely practiced; and primitive tools have been largely replaced by more-efficient white man's products. But on the less-commercialized islands the Polynesians still build the traditional houses, fish from outrigger boats, and cultivate the old crops. Some suggestion of the extent of cultural alterations is contained in the chapter on modern landscapes.

Micronesia means literally, small islands. The term aptly applies to five major archipelagos lying west of Polynesia and north of Melanesia. The plan of island distribution suggests a crude letter T, upside down on a conventionally oriented map or globe. Westernmost of the groups forming the 2,000-mile bar of the T are the Palaus. In the center are the Carolines, which include Yap, Truk, and Ponape. Farthest east are the Marshalls, with 100-mile-wide Kwajalein, Eniwetok, and Bikini atolls; and, a bit offside to the south, the equatorial Gilberts. Forming the stem of the T, and extending northward from the middle Carolines, are the Marianas. Among the individual islands of the latter group are Guam, Saipan, and Tinian.

The total land area of Micronesia is only some 1,200 square miles, or approximately that of Rhode Island. There is no great discrepancy in size among the individual islands, such as is true of Polynesia. There is a very important natural distinction, however, and that is between high volcanic islands and atolls. From the standpoint of numbers, Micronesia is overwhelmingly composed of low coral islands. The more important because of their numerical inferiority are volcanic

Yap, Truk, Ponape, and Kusaie in the Carolines, and Guam of the Mariana group. The relative value of coral atoll and volcanic island to stone-age man was considered in connection with Polynesia.

Coral islands far outnumber volcanic islands in Micronesia, and it is certain that they held the bulk of the 100,000 or more Micronesians of the sixteenth century. Therefore, only by way of contrast the greater richness of material existence on the volcanic islands is briefly suggested. Abundant plant life provided both the important nipa palm and the areca palm, source of betel nut. Edible land birds supplemented the domesticated pig, dog, and fowl. Good-quality taro and breadfruit could be cultivated. Rice was found growing on Guam. Pottery was made in the western Carolines. There was leisure to construct great stone platforms and figures comparable with those of Polynesia. Yap islanders imported large limestone disks of stone money from the Palau, over 200 sea miles to the southwest.

Some few coral atolls are so old and deeply weathered as to support a luxuriant vegetation. The ordinary atoll carries a sparse plant cover composed of few species. Soils are lacking in fine particles and are dry, because of both excessive porosity and frequent drought. Agriculture was a hard proposition for the atoll-dwelling Micronesians. Two trees, the coconut palm and the pandanus, grew fairly well. Only a coarse taro, of the domesticated plant crops, repaid the effort necessary to grow it. Its production meant the laborious digging of deep pits into which brackish water could filter to the growing plants.

Meager vegetable resources had to be utilized fully to satisfy the basic needs of life. The coconut palm was easily foremost in the variety of foods and materials it provided. The green nuts supplied drinking water; the leaves, thatching and materials for mats and baskets. From the husk fiber came cordage and textile thread; from the ripe fruit, edible grated meat, oil, and a skin lotion. Sap new from the flower stalk was a refreshing drink; fermented, it became a powerful intoxicant. From the trunk came planks for boat building and timbers for the frames of houses that composed the little villages stretched along the lagoonal beaches.

Micronesian houses were thatched, but otherwise differed from those described for Polynesia. They were invariably built on platforms of stone or wood, and were rectangular in outline, with high, steep gables. On some of the islands the ridge pole was permitted to sag, producing a saddle-shaped design. The roof, the dominant element of the house, was extended close to the ground. Wall

matting could be removed to permit a free sweep of the breeze.

The pandanus or screw pine was utilized as fully as the coconut palm. The fruit was eaten and from the pounded seeds came a flour used on long sea voyages. The leaves provided fiber and thatch; the branches, light wood.

This is only a suggestion of the stringent limitation of material things. The paper mulberry did not grow on coral atolls; its absence meant no tapa cloth. To take its place was a cloth of skillfully woven fibers. There was no clay, hence no pottery. Domesticated animals were few or absent because of scanty provender. There was no volcanic rock, so all tools, weapons, and utensils were fashioned of shell, wood, and what materials could be salvaged from turtles and fish.

In only one respect did the atolls match resources with the high islands, and that is in sea life. It is not surprising that fishing was the most important economic activity. In no important way did methods and catch differ from those mentioned for Polynesia.

Fishing, boats, and seamanship were well-developed phases of a generally poor culture. Boats were skillfully built and well navigated. In form and construction the craft were much like those of Polynesia, except that the double-hull seagoing vessel was found only in Truk. However, in their large, fast-sailing outrigger the Micronesians could travel the long distances that lay between their small isolated villages. Furthermore, the well-trained Micronesian navigator made from the midribs of palm leaves crude maps that recorded the information necessary to sail from one atoll group to another.

The coral atoll was a poor setting for a primitive self-contained economy. It is a tribute to the industry and resourcefulness of the Micronesian that he got along as well as he did. It is not surprising that he accepted eagerly the devices of civilization that were adaptable to his habitat.

Melanesia, "black islands," is a 3,300-mile-long, 700-mile-wide arc paralleling the northern and northeastern coasts of Australia from the equator to the tropic of Capricorn. To a total land area of about 400,000 square miles, New Guinea contributes over 300,000. The remainder is divided unequally among the Bismarck Archipelago, the Solomons, the Fijis, the New Hebrides, and New Caledonia.

The islands composing Melanesia are largely of the high, volcanic type. Active volcanoes are found on the New Hebrides, the Solomons, and New Britain. On the other hand, there are excel-

lent examples of the coral atoll, particularly in the central portion of the arc.

Total Melanesian population for the sixteenth century is estimated at some 3 millions, three times the figure for Polynesia, and thirty times the number of Micronesians. Introduced diseases have taken their heavy toll, often far in advance of personal contact between European and aborigine. The recovery in numbers noted in Polynesia and Micronesia is not yet in evidence for Melanesia. The trend of decline ties in with the fact that culturally the Melanesians are far less changed than are the other great groups of island peoples. Especially is this true for New Guinea, where it is legitimate to speak of present-day stone-age peoples. True there has been a complete diffusion of tobacco and smoking, to mention one post-European change, but such additions are generally known and can be discounted. The more-advanced Melanesians still contribute culture traits to the conservative Papuans, but this has been going on slowly for a long time and the results are fairly evident.

Discussion of the nature of Melanesian cultures logically starts in New Guinea. This island of tremendous size and natural variety provides abundant opportunity for cultural divergence. There are both inland and coastal peoples; seagoing outriggers give way to river dugouts, and the latter to human portage over interior trails. There is economic room for tribes who live primarily by trading. Single natural resources are so abundant in restricted areas as to be the base of existence; for example, the sago palm provides the staple food for some coastal tribes.

New Guinea has long been exposed to outside culture influences. This does not mean that native life is one grand formless mass of accidentally associated practices. It is fairly easy to distinguish three main cultures. They agree in distribution with the three major groups: Pygmy (Negrito), Papuan, and Melanesian. The association of culture with race is related to difference in time of arrival in New Guinea and opportunity to develop and borrow judiciously in comparative isolation.

The Pygmies live in the central mountain chain of New Guinea, isolated by sparsely populated zones from other peoples. Their culture is completely stone age in character, with the making of stone knives, axes, chisels, and points for their chief weapon, the bow. They are hunters of game and trappers and collectors of all kinds of animal life, even insects, to contribute to their dietary variety.

The Pygmies lack pottery and employ the earth-oven, but they practice a shifting agriculture, planting bananas, sugar cane, taro, and sweet potatoes in clearings that must be changed every two or three years. They have a domesticated pig and they gather the fruit of the pandanus and other wild plants.

The small villages are composed of little, widely spaced dwellings. Houses are walled with split slabs of wood and roofed with thatch; in form they are rectangular in western Pygmy territory and round in the east.

The Papuans (Malay for "wooly hair") adjoin the Pygmies in interior New Guinea and occupy in addition the whole western part of the island and the south coast. The Papuan too, lives deep in the stone age. The ancient spear and spear thrower have not been entirely replaced by the bow and arrow. Pottery is lacking but the domesticated pig is present.

Hunting and fishing alternate in importance with local opportunities. Spears, nets, and traps are used in rivers and along the coast, where simple dugout boats are also employed. On the south-eastern coast the Papuans build expertly and sail and paddle skillfully big outrigger and double-hull canoes. Raiding canoes reach 70 feet in length and are propelled swiftly by 60 or more paddlers.

Limited agriculture produces crops of bananas, sweet potatoes, taro, and sugar cane, with coconuts added on the coast. The sago palm is cultivated to some extent, but more widely the wild trees are the basic subsistence item for many lowland dwellers. A number of tribes regard human flesh as the choicest of all meats.

Houses vary in form geographically. In the west they are square to rectangular; in the east, an elongated rectangle. In the central region appears a round house capped by a high-peaked conical roof. In the south-central coast plain are men's clubhouses attaining dimensions of 300 feet in length by 60 in height. Roofs and walls are made of palm leaves, matting, or bark. Floors are packed earth, or of wood when the house is built on piles. In places there are tree houses, built 50 feet above the ground as an aid to defense and observation.

The culturally and linguistically distinct Melanesians reached New Guinea from the north and east at a comparatively late date, occupied the north, northeast, and part of the southeast coasts, and pushed on to the lesser islands. From their more advanced culture the primitive inhabitants of New Guinea got the bow and arrow, domesticated pig, betel-nut chewing, and seagoing boats.

The Melanesians, like the Micronesians and Polynesians, were a seafaring people. They had

the big double-hulled canoe, and they were ardent traders and fishermen. In other respects too, Melanesian material culture parallels Micronesian and Polynesian practices. Agriculture concentrated on the same crops: taro, bananas, yams, sugar cane, and breadfruit. Too, there were significant differences. The Melanesians were most expert wood-carvers, had pottery, and in New Caledonia used bamboo pipes to irrigate terraced garden plots. Their tapa was inferior to the Polynesian bark cloth, but they did have loom weaving.

Melanesian houses in general resembled the thatched rectangular structures common in Micronesia and western Polynesia. There are departures in the round, beehive-like dwellings of New Caledonia, the large communal houses of New Britain, and pile dwellings built over the sea found elsewhere.

The Melanesians were less subject to the isolation that saved the Pygmies and Papuans. In modified degree Melanesian culture has gone the same course as has Polynesian and Micronesian. It is largely proper to speak of its pure form in the past tense.

Australia. An aboriginal population of 300,000 is estimated for the date of European arrival in Australia. This number was split into some 500 different-sized tribes, speaking so many different languages as to necessitate sign talk for communication between members of unlike linguistic groups.

There was naturally cultural variation among the few people scattered over an immense land. In the north, where there are streams, were dug-out and bark canoes. In northeastern Australia the outrigger was used, very likely a borrowing from neighboring Melanesians. Probably least advanced materially were the tribes of southwestern Australia. Taken at its general level, the low average density of one person per ten square miles may have been saturation for a culture so primitive that it lacked agriculture, domesticated animals, clothing worthy of the name, pottery, and the bow and arrow.

The Australians were nomads in the correct sense of moving for a reason within their tribal boundaries. They were hunters and collectors, who fished when they had an opportunity. Bands moved when needed in order to secure food or other necessities.

Tools, weapons, and utensils were few in variety but exhibited skill of workmanship. Excellent stone techniques were employed to make spear points and various blades. The clever boomerang, clubs, shields, and spear throwers were the principal weapons. Women used digging sticks, stone grinders, wooden trays or troughs, and crude

spindles for twisting thread. Excellent string bags, sometimes woven tightly enough to hold water, were made of fur or vegetable fiber.

As a tracker of animals the Australian hunter was unexcelled. Also he was patient, wise in the way of animals, and knew the weather signs and the way to the nearest water hole. The hunter captured and trained the young of the wild dingo to help him; poisoned springs and concealed spears in brush heaps to secure the wary emu. Collecting utilized a practical knowledge of plants and the smaller forms of animal life: where and when to go to find roots, seeds, edible insects, and wild honey. A surplus of food meant gorging, since there was little effort to store against future need. Poor hunting and collecting meant hunger immediately. Alternate feast and famine was a normal sequence.

Houses were generally no more than the crudest wind breaks. The most pretentious were small dome-shaped affairs of saplings and mud, built more for protection against mosquitoes than against the elements. Even in cold weather the naked aborigine preferred to sleep in the open and on the ground between fires. There was no place in his essential nomadism for a permanent home and furnishings.

Today the native Australians number 80,000, inclusive of half-castes, many of whom live like Europeans. Enormous areas in Australia are inhabited exclusively by natives, but that does not alter the fact that they are few and growing fewer.

Tasmania. Just as Tasmania is physically isolated, so were its aboriginal inhabitants culturally as well as racially distinct from any other people. The Tasmanians were probably the most primitive group that survived to modern times. They lacked agriculture, pottery, domesticated animal, true clothing, the fishhook, boomerang, bow, and spear thrower. They used fire but it is doubtful if they knew how to make it; chipped crude knives and scrapers but did not know how to haft a point. As a result, the major weapon, the spear, was simply a sharpened pole. The only other manufactured weapon was a combined club and throwing stick made of wood. Baskets and string nets were used for carrying and storage.

The 2,000 pre-white inhabitants of Tasmania were broken into a number of tribes, each jealously confined within strict territorial boundaries. Hunting was the primary source of food. Large mammals were secured by individual still-hunters, or by groups using a circle fire. No form of animal life, dead or alive, large or small, was too

repulsive to be eaten. Gathering of vegetable foods augmented hunting. All forms of shellfish were collected and relished, but strict tahoos barred the use of true fish, even if they could be caught without the fishhook. Like the Australians, the Tasmanians never stored any surplus food.

Crude dwellings, generally mere wind breaks, made up the villages, located on the seashore in

winter and inland during the summer. Despite familiarity with the sea, Tasmanian boats were nothing more than raft-like affairs constructed from bundles of bark and quite incapable of going any distance.

The first permanent European settlement was made on Tasmania in 1802. There followed mistreatment of the natives that is without parallel. The last of a few survivors died in 1876, bringing to extinction this interesting if primitive people.

50: Modern Landscapes

The European discovery of the Pacific World was no mere accident. A better route to the Indies was the objective of innumerable voyages that brought ships and white men to the Pacific islands. Spain and Portugal were concerned regarding the limits and resources of the new world that had been divided between them. Primarily the Spaniards and Portuguese wanted wealth that could be carried back to Europe. This they could get by conquest, or, if necessary, by barter with the natives. They were anxious to make converts to Christianity. Some few who knew about it were even interested in the old classical concept of a *Terra Australis* or southern continent, because the discovery of a vast new section of the earth's surface might mean rich lands and peoples.

The Dutch, English, and French explorers who succeeded the Spaniards and Portuguese were largely motivated by the same desire to secure wealth. Not until the middle of the eighteenth century was there ushered in an era of scientific exploration, dedicated to adding to the sum of human knowledge regarding the Pacific. Although the basic discoveries were completed by the end of the eighteenth century, exploration for knowledge and exploration for pecuniary profit go on to this day, particularly in the depths of the larger islands.

EXPLORATION

The first recorded European penetration of the Pacific World was made by Magellan, who in 1521 stopped at Guam on his voyage westward to the Philippines. Magellan's discovery opened the route between Mexico and the Philippines. For 200 years the Manila galleons were carried westward by the trade winds through the Marshall, Caroline, and Mariana archipelagos of Micronesia. Needless to say, the Spaniards became very familiar with these islands.

In 1527 the Portuguese Meneses touched the northern shore of New Guinea, named the island Papua and pronounced it part of *Terra Australis*. Fifteen years later a Spaniard, Gaetano, discovered the Hawaiian group. Between these two outposts of the Pacific World another Spaniard,

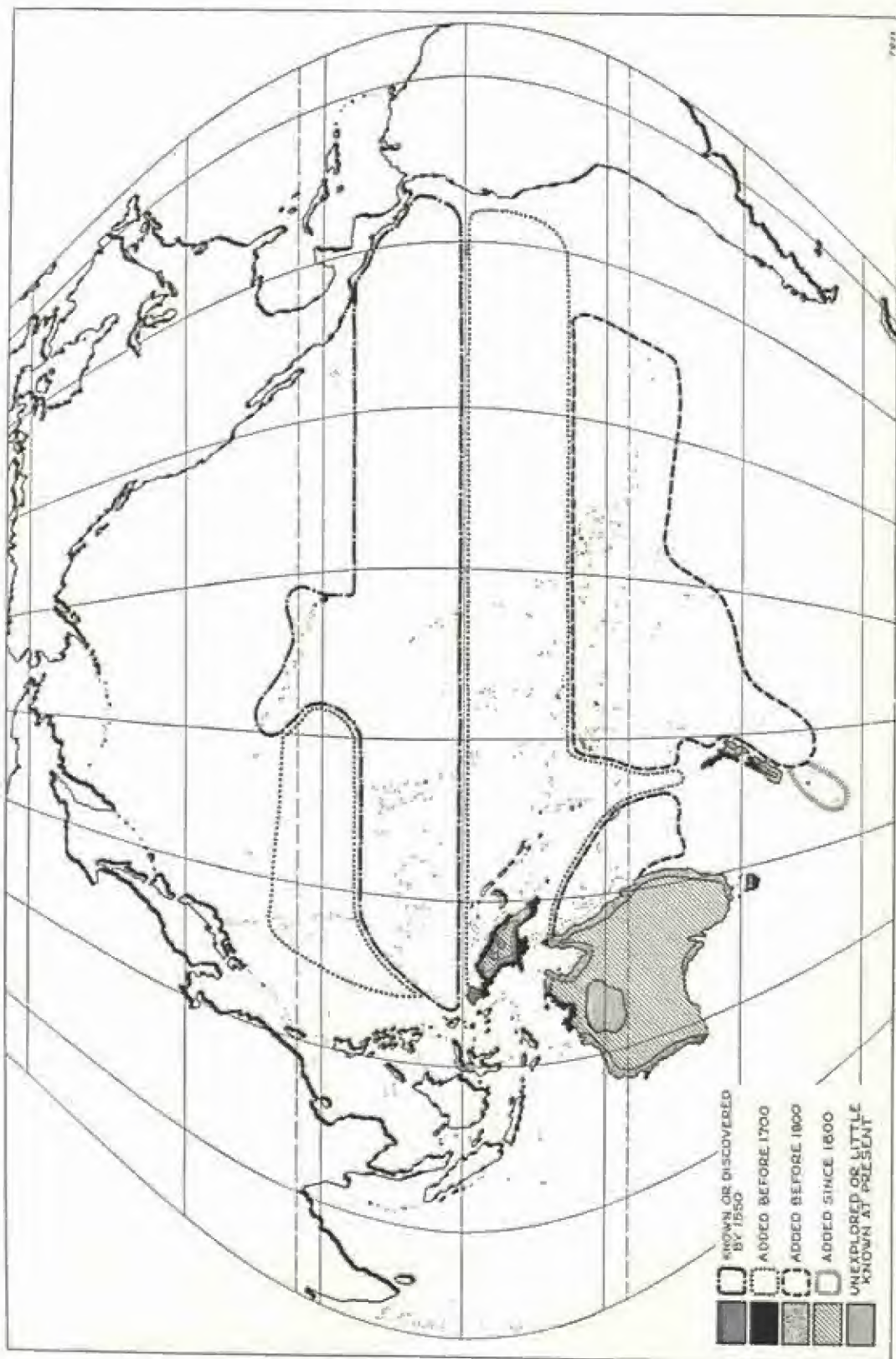
Neyra, added the Ellice Islands and the Solomons in 1568. Both Hawaii and the Solomons were "forgotten" by Europeans for two centuries. Quiros was pilot of a fleet from Peru that reached the Marquesas and the Santa Cruz Islands in 1595. Quiros was commander of another expedition that discovered the Tuamotus and the New Hebrides in 1605. One of Quiros's lieutenants, Torres, sailed through the strait that bears his name, and by so doing proved the insular character of New Guinea.

About the middle of the seventeenth century Dutch navigators ventured away from the established route to Java which had familiarized them with the shores of western Australia. In 1642-43 Tasman sighted Tasmania and New Zealand, believed them parts of Australia, and sailed on to Tonga. Another Dutchman, Roggeveen, 80 years later discovered Easter Island and western Samoa. Still later, a Frenchman, Bougainville, in 1767 reached Tahiti, Samoa, and the New Hebrides. He proved the last, originally found by Quiros in 1605, to be islands rather than parts of a great land mass.

James Cook, Englishman and greatest of the early scientific explorers, reached Tahiti in 1769. In 1770 he landed at Botany Bay on the east coast of Australia, then sailed northward to Torres Strait. This trip demonstrated that New Zealand was not part of Australia. In 1774 Cook added New Caledonia to the list of known islands, and in 1778 rediscovered Hawaii. With Cook's passing the great discoveries were over, and the Pacific World was easily accessible to Europeans of quite different character.

NEW WORLD REVOLUTION

The nature and results of the European impact upon the primitive Pacific World differ only in detail from those of European impacts upon Africa and the Americas. The sequence of the alien invasion has always been the same: first the discoverers, followed shortly by traders and missionaries, and finally by armies and empires. The three phases are not mutually exclusive as to time or even as to personnel, and the order may occasionally be reversed, but the results are similar.



Pacific World; European exploration

The Pacific World did not supply the abundant ready wealth sought by the first Europeans to reach it. New Guinea, for example, early in the sixteenth century was counted of little value because it was inhabited by savages, had few good harbors, and lacked gold, spices, and gems. Trade and commercial development had to await those satisfied with somewhat-more-modest returns.

Missionary zeal was not conditioned by possible economic returns, but a limited number of priests could produce greatest results where native populations were accessible and dense. Jesuits were established on Guam by 1668; in 1690 missionaries began their activities in Polynesia. By way of contrast, the Marist order, first to work in New Caledonia, did not arrive until 1843. There are still areas, particularly in New Guinea, where no missionary has been. However, virtually all Polynesians and Micronesians are at least nominally Christian.

Traders found profit in items such as tortoise shell, pearls, sandalwood, trepang, and later, coconuts and copra. For whalers from America and Europe the islands were convenient sources of provisions and fresh water, and delightful spots for respite from a hard existence. Agriculture for profit began early on Guam and it spread widely to other islands. Sugar, coconuts, tropical fruits, cattle, and even cotton eventually became commercially important products. And the search for minerals was finally rewarded on the larger western lands: gold in Australia and New Guinea; chromite and nickel on New Caledonia; and miscellaneous minerals here and elsewhere.

This, in brief, was the nature of the European impact. The results, omitting those of a spiritual nature, were important to the extent that they changed economic practices and determined vital trends. Traders introduced steel axes, guns, cloth, tobacco, mirrors, and glass beads. Horses and cattle were brought to the larger islands and other European domesticated animals were widely distributed. Tobacco, cassava, citrus fruits, arrowroot, guava, and pineapple are but a few of a host of both useful and weed plants that were added to the native flora. Missionaries spread the use of European-type clothing and shoes. The native was forced to change from a subsistence to a commercial economy if he wished a share of the new goods. Many had to learn one of the numerous pidgin languages in order to enter the world of trade.

Vitally, the native population did not fare at all well. Smallpox, Asiatic cholera, tuberculosis, dysentery, influenza, and even measles and the common cold were all new to the Pacific peoples; against them they had no immunity. There were

bloody conflicts between Europeans and natives. Between 1860 and 1903 thrived the infamous practice of "blackbirding," whereby thousands of natives, particularly Solomon Islanders, were kidnapped into virtual slavery. They worked on the guano islands off the Peruvian coast, and were sent to the Fijis as cotton pickers, and to the sugar plantations of Australia. Many, perhaps a majority, did not survive to return home.

As early as 1686 the original 30,000 natives of Guam had been reduced to 100 by disease and war with the Spaniards. Guam and other depopulated islands of the Marianas and western Carolines were later peopled with imported Filipinos. At present there is a strong distinction between the Indonesian and Malayan *Chamorros* of western Micronesia and the Polynesian-like *Kanakas* of eastern Micronesia.

Some 60,000 New Zealand Maori, armed with European guns, were killed in intertribal wars, and more were slain in battles with the whites. As late as 1875 a measles epidemic killed 40,000 Fijians, nearly a third of the total for that date. Polynesians were reduced from an original 1.1 millions to 180,000 in 1900; specifically, Hawaiians from 200,000 to 40,000, and the once-numerous Marquesans to 2,000 for 1926. The Tasmanians were exterminated, and the Australians declined to a fraction of their former numbers. The 1 million Melanesians are about a third of their original figure. While for Micronesia and Polynesia there is now a general increase among the native peoples, new human breeds are emerging, various mixtures of many racial groups.

POLITICAL DOMINATION

The New World Revolution eventually placed the Pacific World in European hands politically. Spain made the first move by asserting its claim to western Micronesia near the end of the seventeenth century. When Tonga became a British protectorate in 1900, foreign political control of the Pacific World was complete.

The mechanics of empire building in the Pacific parallel those employed elsewhere. Discovery, seizure, purchase, treaty, war, and colonization have all contributed to make the complex political map of the Pacific World. While Spain's ownership of Micronesia reaches back to the seventeenth century, the major distribution of the islands among European powers took place during the nineteenth century, much of it contemporary with the final partition of Africa.

Micronesia illustrates several bases of owner-

ship. With the exception of the Gilberts, all archipelagos were discovered and held by Spain until 1898. Then Guam was ceded to the United States and the remaining islands sold to Germany. Following World War I the German-owned section was made a mandated territory of Japan. Now, subsequent to World War II, the islands are a trust territory of the United States as the Territory of the Pacific Islands.

The French occupied the Marquesas in 1842; claimed New Caledonia in 1843 and occupied it in 1853; and in 1844 made the Society Islands a protectorate. Great Britain established a penal colony at Port Jackson, Australia, in 1788, another in Tasmania in 1803, and somewhat reluctantly declared New Zealand a possession in 1840. The British East India Co. claimed New

Guinea in 1793, the Dutch the northern coast in 1848, but the final division among the Netherlands, Britain, and Germany was not completed until the 1880's. Hawaii was a republic for a few years prior to becoming a protectorate of the United States by treaty in 1898; it was made a territory by congressional act in 1900. These historical details are samples of the processes of empire building.

The present distribution of political controls follows no regular pattern. Areally the British are far in the lead, with Australia, New Zealand, eastern New Guinea, the Solomons, Bismarck archipelago, and, jointly with France, the New Hebrides. Continuous with the preceding, the British domain includes a portion of central Polynesia, and far to the east, isolated both geographically and politically, Pitcairn. France is well represented across the south Pacific, from New Cale-



Pacific World: political

donia on the west to an eastern cluster that includes the Tuamotus, Marquesas, and Society Islands. The United States, in addition to the Hawaiian Islands, has Wake, Guam, part of the small equatorial islands, divides Samoa with Great Britain, and now holds in trust the Territory of the Pacific Islands. Another American nation, Chile, owns lonely Easter Island.

Perhaps there is a fourth phase of the European impact, represented by a regaining of political independence. Such is practically true of Australia and New Zealand. It has precedent for native peoples in the political independence realized by the Philippine Islands on July 4, 1946. The granting of political independence implies a thorough integration of European culture and a successful participation in world commercial relations.

COLONIZATION

European colonization has proven the most effective means of gaining and holding political control, and it is certainly the cause of greatest cultural changes. As early as 1595 the Spaniards attempted unsuccessfully to establish colonists from Peru in the Solomons, but there were no more important settlements of Europeans until late in the eighteenth century. Traders appeared and there was some alienation of native lands, but neither led to a numerical domination of Europeans.

From 1788 to 1839, Britains were transported to the Australian penal colonies. British missionaries reached New Zealand in 1814, but colonization came only in 1840. During the 30 years between 1864 and 1894, 40,000 French convicts were sent to New Caledonia. American missionaries initiated a trickle of white colonists to the Hawaiian Islands in 1820. Today there are two "white" countries in the Pacific World, Australia and New Zealand. In Australia the numbers of Europeans and natives are 8.4 millions and 80 thousands, respectively; in New Zealand, 1.9 millions and 113 thousands. Nowhere else are Europeans the majority population element, although in New Caledonia they number 20,000 as compared with 30,000 native Melanesians, and 12,700

Asiatics; in Samoa, 3,000 to 49,000 Polynesians; in the Societies, 6,200 to 24,800; and in Hawaii, Europeans comprise about one third of the 540,000 population. This enumeration covers all places where Europeans occupy an important place numerically.

White Europeans and various natives by no means complete the racial groups represented in the Pacific World. Chinese traders are everywhere among the islands, several hundred of them even in the distant Tuamotus. There was early importation of Filipinos to nearly depopulated western Micronesia. When European-directed commercial agriculture got underway, an inherent dislike of regular work on the part of the dwindling native populations necessitated an importation of labor. Particularly was this true of the Fijis and Hawaii. After 1852 there were brought to the Hawaiian Islands Portuguese, Spaniards, Puerto Ricans, Filipinos, Chinese, Japanese, Koreans, other Polynesians, and even north Europeans. And, during their control over Micronesia, Japanese were systematically colonized, particularly in the Marianas and Palaus.

Following is an analysis for each island group where population composition shows the dominance or strong numerical importance of groups other than white or native. The figures are approximate for the period immediately prior to World War II. They do not take into account changes during or after that event.

It is evident that the population composition of the Pacific World has undergone profound changes during the New World Revolution. It seems certain that, with the possible exception of New Zealand and Australia, the future lies with people of non-Caucasian stock. But, however diverse the racial contributions may have been, the cultural changes most largely follow a pattern that was designed in Europe.

MODERN REALMS

Native cultures can no longer be the sole basis for dividing the Pacific World into culture realms. To them must be added consideration of the

Table 30 Population composition of selected Pacific island groups

<i>Micronesia</i>		<i>Melanesia</i>		<i>Polynesia</i>	
<i>Palaus</i>		<i>Fijis</i>		<i>Hawaii</i>	
Japanese	9,500	Melanesians	107,100	Asiatics	268,000
Kanakas	6,360	Asiatics	104,000	Europeans	190,000
Chamorros	200	Europeans	4,000	Polynesians	11,000
<i>Marianas</i>				Part "	70,000
Japanese	39,000			Others	1,000
Chamorros	4,300				

changes that have taken place since the first contacts with Europeans. Commercial agriculture, mining, forestry, commerce, urbanization, and industry are new divisions of the measuring stick. It is immediately apparent that Australia and New Zealand stand together and apart from the remainder by reason of their extreme Europeanization. At the other end of this particular scale lies western New Guinea, virtually unaltered by European contacts. Between the two extremes but toward the Australia-New Zealand end fall Hawaii, the Fijis, the Marianas, New Caledonia, and the Societies. It would be quite possible to arrange island gradations all the way from one end to the other without leaving serious gaps.

On the dual basis of the character of surviving aboriginal cultures and the degree of change caused by the New World Revolution, the Pacific World may be divided into four modern realms: Polynesia (without New Zealand); Micronesia; Melanesia; and Australia (including New Zealand).

Modern Polynesia. The 10,000 square miles of Polynesia are divided into six major archipelagos scattered across the mid-Pacific between the tropics. Five of the larger groups lie south of the equator, and one, Hawaii, to the north.

As between northern and southern groups, the latter are least changed culturally and racially, although they too shared the general decline in num-

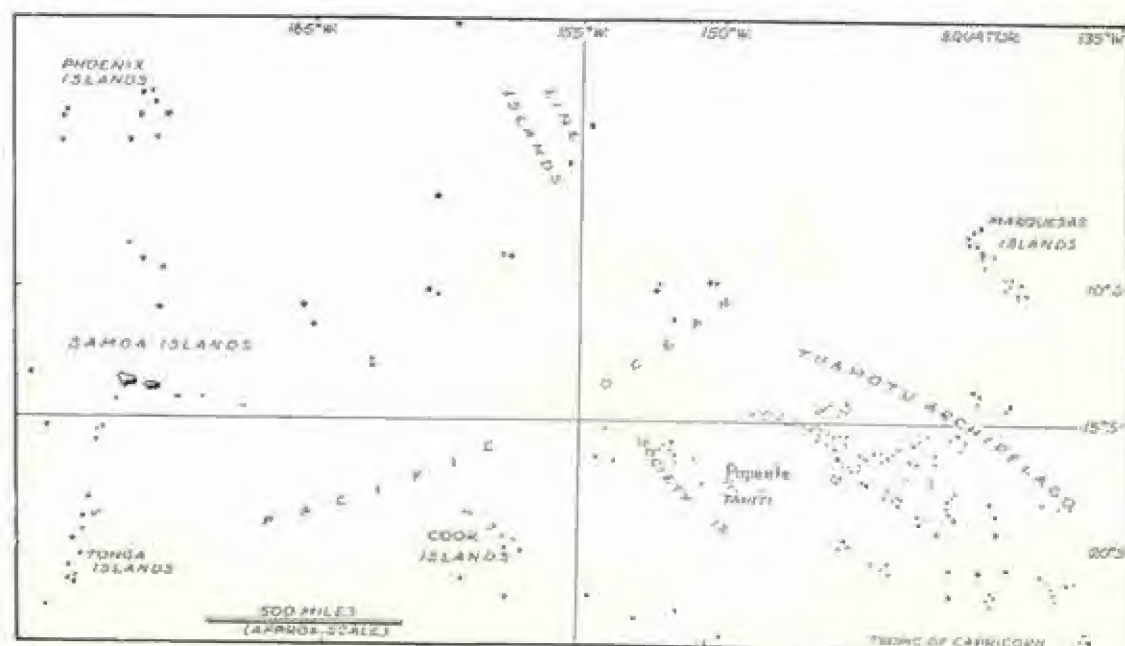
bers of native inhabitants. Land is still owned in the main by Polynesians who in large part remain subsistence farmers and fishermen. Copra is the major article of export. Imports are limited by the meagerness of the exports.

Possibly least changed culturally are the hurricane-swept atolls comprising the Tuamotu group. The islands are occupied by some 4,300 Polynesians, perhaps 200 Chinese traders, and a dozen white men. Pearls are the primary contribution to commerce.

The Marquesas are inhabited almost exclusively by the 3,000 descendants of the 100,000 Polynesians whose villages once filled the valleys of these rich volcanic islands. Small amounts of sugar, cotton, and copra are exported.

Tonga and Samoa jointly have some 129,000 inhabitants, nearly all of whom are Polynesians. Both export a little copra, but otherwise are given to the cultivation of traditional food plants and harvesting the crops of the sea. Probably more than anywhere else in Polynesia, the natives of Tonga and Samoa have been left in possession of the land, freed of disease, and protected from predatory aliens.

The Society Islands are best known of all the southern archipelagos, particularly the island of Tahiti and its chief town, Papeete. With their production of copra, sugar, phosphates, and mother-of-pearl, and Papeete's 12,000 inhabitants, the Society Islands are more commercialized and "civilized" than is any other group south of Ha-



Southern Polynesia: index map

wali. Total population of the Societies is about 30,000.

The Hawaiian Islands are very different from the southern archipelagos. They contain 6,000 square miles out of the 10,000 total for Polynesia and over two thirds of the total of 760,000 inhabitants. Polynesians are a decided minority of the population. Land has long been alienated from the natives, and is used to produce commercial crops, notably sugar cane and pineapples.

Hawaii does little manufacturing and has no important minerals, but is busy commercially and industrially in connection with agricultural production. It is normally necessary to import food, after the fashion of plantation agriculture elsewhere in the world. There are military and naval installations, beaches, clubs, and all the other symbols of modern civilization. Honolulu is a bustling city of 250,000. All these and additional attributes combine to lift Hawaii out of the semi-Polynesian world to the south and place it squarely in the New World of Australia, New Zealand, and mainland United States.

Modern Micronesia. As is generally true throughout the Pacific islands, a good indication of the extent to which the several Micronesian archipelagos have experienced the New World Revolution is the composition of their respective populations. If the populations are overwhelmingly native, a modified old order persists. The addition of a few Chinese means trade, usually in copra, mother-of-pearl, pearls, and other commodities that are simply gathered rather than commercially produced. A goodly representation of Europeans, particularly if reinforced by a like or greater number of Asiatics, indicates plantation agriculture or some other form of fairly intensive production. The implication of the latter situation is that Europeans direct Asiatic laborers.

The application of the population test to Micronesia is complicated by the heavy infiltration of Japanese during the last quarter century. In large part the Japanese were engaged in constructing military and naval installations rather than in economic development. Nevertheless, on the basis of population composition the division of Micronesia into two parts seems justified. The Gilberts, Marshalls, and adjacent part of the Carolines fall into one division, the remaining Carolines and the Marianas into the other.

The southeastern division, which includes the Gilbert and Marshall groups, is a region of coral atolls and native populations. The natives number around 50,000, with perhaps a hundred Europeans, several hundred Chinese, and an unknown number of Japanese. Native economy is based on limited cultivation of the old crops and fishing.

Commercial production is only enough to pay the traders for such articles as matches, cloth, and tools that are now part of native life.

A discordant note is introduced by two small islands, Nauru and Ocean, which lie in the open sea west of the Gilberts. Here some 2,000 natives are matched in number by Chinese, and there are perhaps 200 resident Europeans. This surprising situation is due to the presence of phosphate deposits, which give the two small islands commercial importance out of all proportion to their size.

In the Marianas and western Carolines, the second division of Micronesia, population composition reflects long and steady exposure to the outside world. The so-called natives are largely non-aboriginal, and at present are far outnumbered by Japanese.

The early Spaniards made some effort to develop the high rich islands. On Guam they introduced a variety of crops, in addition to cattle and water buffalo. The native-made carts, with their wheels sliced off a log, are an interesting cultural adaptation. Spanish architecture persists to the present.

Plantation agriculture is fairly widespread and there is some phosphate production in the Palau's, but the greatest changes and most modern developments are evident in Guam. With dimensions of thirty by eight miles, it is the largest of the Marianas. It is also the most productive, with exports of coconuts, sugar, rice, coffee, cacao, and additional native and introduced crops. Nearly half the island's 30,000 inhabitants live in Agaña, an interesting mixture of old and modern, and one of the leading cities of Oceania.

Micronesia is a meeting ground of Oriental and European cultures. The outcome of the contest between two alien ways of life may be influenced by matters military, but it likely rests more upon the composition of the population and the



Hawaiian Islands: index map

more successful utilization of the land. If these be the deciding factors, the Orient should win.

Modern Melanesia. Analysis of the population composition of the six major groups and other islands composing Melanesia reveals a regular gradation from one end of the island arc to the other. At the southeast are the Fijis and New Caledonia, for both of which the total of Europeans and Asiatics equals the number of natives. At the other extreme is New Guinea, where natives outnumber combined Europeans and Asiatics by a ratio of 130 to 1. It may be reemphasized that the extent of commercial development directly parallels the population composition.

The Melanesian islands average far larger in size than Micronesian and Polynesian islands, and they are higher and rougher. Both differences become more marked at the western and equatorial end of the arc. A combination of tropical coasts and impenetrable interiors has doubtless slowed modern development and preserved native cultures.

Representative of one extreme of development are the Fijis, a compact group of 250 islands, of which one, Viti Levu, has an area of 4,000 square miles, and another, 2,000. Eight of the islands are inhabited by some 150,000 natives, an equal number of Asiatics, and 5,000 Europeans.

The native Melanesians are disinclined to work on the plantations, so practice a subsistence agri-

culture and fish. The Europeans direct Asiatic laborers on large land holdings that produce principally sugar cane.

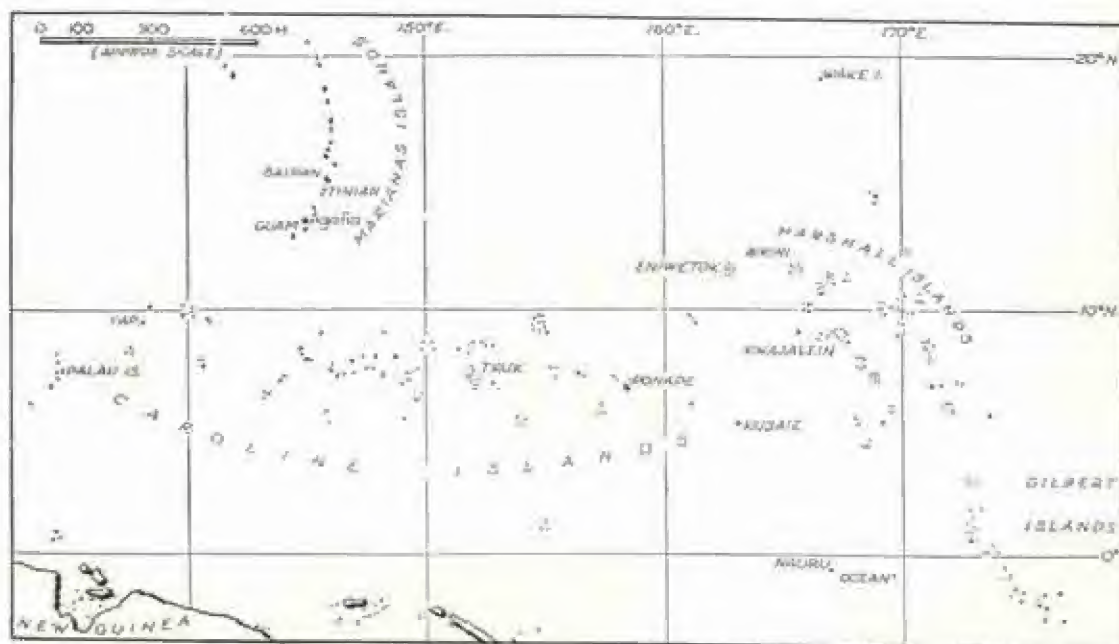
The principal city of the Fijis, Suva, lies in southeastern Viti Levu on a magnificent natural harbor. The 15,000 residents of this attractive city include most of the white population of the islands.

New Caledonia is a mountainous island, 250 miles long by a maximum width of 38 miles. While combined Europeans and Asiatics equal in number the 30,000 native Melanesians, Europeans outnumber Asiatics two to one.

Rough as it is, the island produces a considerable export of coffee, copra, and meat. But the main commercial enterprise is mining. New Caledonia is one of the few producers of nickel. It also exports chromite, and iron and manganese ores. The natives have little part in the mining and commercial agriculture, but stick largely to their own excellent subsistence farming.

Noumea, a city of 16,000 inhabitants, lies at the extreme southern tip of New Caledonia, and is the administrative center for all French possessions in the south Pacific.

The 80 high islands making up the 5,700 square miles of the New Hebrides are inhabited by 60,000 Melanesians, 1,000 Europeans, and a like number of Asiatics. The ingredients of the economic order are the same as those found in the Fijis; the proportions are different. Fewer Asiatics are supervised by Europeans on less acreage pro-



Micronesia: index map

ducing copra, cacao, and coffee. Consequently the natives have a greater share of the land on which to lead their nearly self-sufficient lives.

The Solomons and the Bismarck group are alike in showing still less European influence and greater dominance of native peoples and customs. The Bismarck Archipelago has about twice the population of the Solomons; together they have some 280,000 Melanesians, 1,000 Europeans, and 500 Asiatics. The islands of both groups are large, high, and rough. New Britain has an area of 13,000 square miles, while Bougainville, largest of the Solomons, has 3,500 square miles. Plantations are restricted to the coasts; the interiors remain largely unknown. The plantations, which produce mainly coconuts, in the aggregate measure probably several thousand acres. The figure is impressive until it is compared with the total area of the islands.

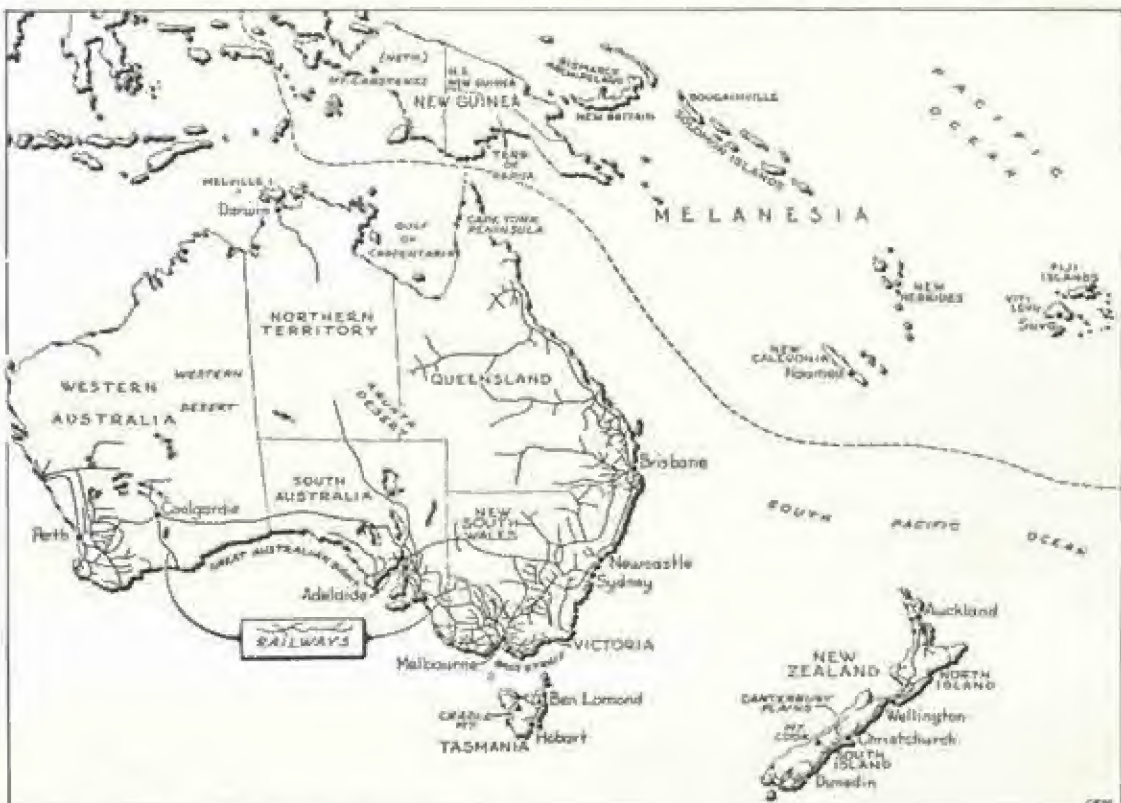
New Guinea is the far end of the arc, geographically and culturally. Here the eastern, British-controlled half of the island is more developed than is the western, Dutch part. Lack of transportation facilities has kept plantations and traders restricted to coastal sections. Plantations produce coconuts, rubber, sisal hemp, cacao, and

coffee. Chinese still trade with natives in Dutch New Guinea for bird-of-paradise plumes; the standard article in return is a twist of tobacco. Placer gold has been mined, and the island is known to contain commercial deposits of coal, copper, silver, lead, and zinc. An intensive search for petroleum was interrupted by the war. The resumption of prospecting and the use of airplanes will certainly modify this last stronghold of stone-age culture.

AUSTRALIAN REALM

In Australia and New Zealand the revolutionary changes resulting from the European impact have virtually reached completion. The two countries are as typically products of the New World Revolution as are the United States and Canada. Aboriginal peoples and cultures are reduced to insignificance. The population is overwhelmingly Caucasoid and it is commercially minded. Industrialization is at least incipient and urbanization is well advanced.

The changes were slow to get underway. Just as



Australian and Melanesian realms: index map

all Canada was deemed less valuable than two or three small sugar-producing West Indian islands, so seventeenth-century Australia was of little interest to those who passed it on the way to rich Java or the Moluccas. The desert west coast sighted by passing vessels suggested no valuable spices, gems, and fabrics, and the few primitive natives, no opportunities for trade. British North America had been colonized for two hundred years and an independent United States born before any European settlement was made in Australia. Remoteness was the handicap that delayed it so long.

Australia is antipodal to the British Isles, and furthermore, it lies in the southern and water hemispheres of the earth. It is distant from the center of the land hemisphere and the center of population. Sailing vessels outward bound from Europe to Australia passed far to the south of the Cape of Good Hope in order to catch the westerly winds and be carried across the open South Indian Ocean. The homeward trip meant an even longer stretch of barren sea, the South Pacific, and the rounding of stormy Cape Horn at latitude 55° S. Even modern steamers sailing much more directly through the Suez or Panama Canal must go a distance of 12,000 miles by either route between London and Sydney.

Australia. It was appreciation of Australia's remoteness that led to the establishment of the first European colony on the continent. With the United States no longer available as a place of banishment, distant Australia seemed a logical successor. In 1788 a British penal colony was established on Botany Bay, a site discovered and named by James Cook. Within a short time the settlement was moved 12 miles north to Sydney, on the magnificent harbor of the same name.

Additional nuclear settlements came slowly. In 1803 a convict colony was established at Hobart in Tasmania. In 1824 a settlement was founded at Brisbane, some 450 miles north along the coast from Sydney. In the same year a military garrison to ward off threatened French encroachment was located on Melville Island, off the central-northern coast of the continent. At the southwestern corner came Perth in 1828. In the southeast, Portland was founded in 1833, followed by Melbourne in 1835. The last of the early nuclei was Adelaide, South Australia, settled in 1836.

The expansion of settled areas was slow and uncertain. There was necessarily fumbling experimentation to find out just what the land would produce. English grains might not do well in a hot-summer climate. A few miles from the coast the

country was totally unexplored. There was little or no population surplus to fill an ever-expanding frontier.

While wheat and barley did none too well around Sydney, livestock, particularly sheep, seemed well adapted to natural conditions. Trial and error gradually produced an unformulated program of expansion and utilization. The early nuclear settlements all lay in the well-watered coastal lands. Settlers, who were both stockmen and farmers, at first pushed along the coast and only gradually spread toward the dry interior. Herdsmen were the vanguard of the inward movement, and they were confronted immediately with the problem of ever-increasing aridity.

In 1810 sheep from the Sydney settlement reached the plains west of the mountains. By 1831 coal was being mined at newly founded Newcastle, 70 miles north of Sydney. An interior settlement across the mountains from Brisbane was founded in 1840. Herdsmen were also marching inland from southern and southwestern Australia. In 1863 they were established on the north coast near Darwin. By 1866 sheepmen had reached the very heart of the continent, along a narrow tongue extending from the southeast between the barren, waterless, sandy Western and Arunta deserts. Complete closure of pastoralists around the margins of the deserts was not realized until near the end of the century. Wool production then attained its zenith, and since has been declining gradually.

Meanwhile, changes were taking place in the wake of the advancing frontier. Dry farming of wheat and other grains proved successful on the steppe plains. In coastal Queensland sugar cane was introduced in 1862. After 1879 wells drilled in the great artesian basin of south interior Queensland and adjacent states doubled its stock-carrying capacity. Irrigation was initiated in the Murray River section in 1887, eventually to produce cereals, alfalfa, rich pasture, and raisins and currants for the export market.

Seven-hundred convicts and 200 soldiers comprised the original Sydney colony. Natural increase and immigration brought the total to 5,000 in 1800. Inclusive of all Australia the figure was 33,000 for 1820; 190,000 for 1840; and for 1850, 405,000. In 1860 the total jumped to 1.1 millions. In 1890 it was about 3 millions; 5 millions in 1920; and at the present time, about 8.4 millions.

The rate of population growth has clearly been irregular. Sudden increases indicate accelerated immigration. The latter has always been due to sudden expansion of economic opportunity. In 1840-41 a land boom based on the prosperity of the wool producers brought a jump in the number

of immigrants. Preliminary gold discoveries were climaxed by major strikes in 1851 at Bathurst, west of Sydney, and at Ballarat and Bendigo, in Victoria; the population nearly tripled between 1850 and 1860. During the 1870's came a mining boom in Queensland; optimistic expansion of railroads; and the discovery of tin and gold in Tasmania. The first big gold strike in Western Australia was made in 1887; and 1892 marked the opening of the rich Coolgardie deposits in the same region. Each discovery and boom drew hopeful immigrants to Australia.

Australia's 8.4 million inhabitants are overwhelmingly of British stock. The proportion descended from early penal settlements is slight, since by 1830 convicts were outnumbered by free colonists, and in 1841 constituted no more than one fifth of the total. Other than the dominant Europeans are an estimated 48,000 full-blood aborigines, 30,000 half-castes, and about 20,000 Orientals. Additional racial elements are negligible.

The density distribution of population is striking. Outside the eastern and southern marginal humid strips the country is virtually unpopulated by Europeans or, for that matter, by anyone else. Even along the southern margin there is a complete break between a southwestern population cluster and those to the east. The aborigines are most numerous in the interior and northwest, where Europeans are fewest.

A further striking feature of population density distribution is a high degree of urbanization. Australia's five largest cities, Sydney, 1.6 millions; Melbourne, 1.3; Brisbane, 0.44; Adelaide, 0.42, and Perth, 0.29, contain 47 per cent of the total population of a country that is primarily agricultural. The same explanation will not serve for both coastal concentration and urbanization.

The restriction of the bulk of the population to coastal or near-coastal clusters is largely a matter of climate. It is estimated that of the total continental area, 21 per cent is temperate crop land; 3 per cent, tropical crop land; 26 per cent, good pastoral land; 27 per cent, fair to poor pastoral land; and 23 per cent, desert. The population clusters coincide with the good lands. The sparsely settled lands are those with meager rainfall, few agricultural possibilities, and limited pastoral resources.

For each of the population clusters surrounding the major cities there is a productive hinterland. The southwestern region around Perth produces wheat and other grains, apples, and grapes. There is a back country with placer-gold mines. Water piped 300 miles from the coast to the mines is shared with irrigation projects and used to water

sheep that otherwise could not be there to crop the desert herbage.

From the nucleus of South Australia centered about Adelaide comes the inevitable wheat, other grains, hay, and grapes. Pastoral country, with sheep dominant, stretches off northward to the very heart of the continent.

Melbourne has a hinterland that is more productive and varied than the preceding. Accompanying wheat are excellent grazing country for fine cattle, dairying, and the vineyards of the irrigated Murray basin. In southeastern Victoria is the continent's finest eucalypt forest. Also tributary to Melbourne is Tasmania, with specialties in apples, hops, and potatoes.

New South Wales is also a producer of wheat, fine cattle, and dairy products. Sydney is something of a dividing point between temperate and subtropical crop zones. Potatoes and deciduous fruits are produced to the south of Sydney, while not far to the north are outliers of rice and sugar cane.

Queensland, too, produces cattle and wheat, but a thin coastal strip north of Brisbane has for its major crop, sugar cane; accompanying it are cotton and minor amounts of bananas and pineapples.

Clustering of population and production is necessarily accompanied by an intensification of other elements common to the cultural landscape. A case in point is transportation facilities, specifically railroads. The most intricate network of Australian railways lies in the southeast, in the regions tributary to Melbourne and Sydney. Feeder lines extend to the interior plains, there to end abruptly. A through line reaches far to the north in Queensland, parallel to the coast, and a branch runs west to a point south of the Gulf of Carpentaria. There are secondary networks tributary to Adelaide and Perth, and a transcontinental line connects them with the southeastern system. From Adelaide a line reaches the middle of the continent. Beyond, in the whole north and northwest, there are but two significant railroads. One runs south from Darwin for some 200 miles, and the other is a short line from the sea to mines near the northwestern coast. The utility of the Australian railroads is greatly reduced by differences in gauges. They were not planned as an integrated system, but were built as individual lines, each for a specific purpose.

River transportation was once important on the Murray system, and even the Darling was used during flood stages. Railroads and highways have captured the traffic, and navigation on the Mur-

ray is restricted to an occasional excursion steamer.

But Australia's high degree of urbanization remains quite unexplained. It is true that industrial production is roughly equal in value to agricultural production, and each is about the same as combined pastoral and dairy production. But the Australian exports that are sold on world markets are headed by wool, and range through wheat, meats, butter, hides, and other pastoral and agricultural products, to relatively unimportant values in gold, lead, and other minerals. Imports include machinery, cotton cloth, chemicals, steel, and other manufactured goods. Clearly, Australian industry is largely concerned with preparing raw materials for export, and manufacturing is insufficient to supply home consumption. Industrialization does not explain urbanization; perhaps cause and effect work the other way.

It is pointed out that as early as the 1830's the tendency on the part of newly arrived immigrants was to remain in cities rather than to pioneer the land. Today that tendency is exaggerated, and additionally, the cities have drawn from the land to the point where Australia is two-thirds urban. The trend is not peculiar to Australia; it is only

high in degree. The phenomenon is encountered in many of the areas affected by the New World Revolution. It appears that many Europeans prefer to live in cities, where they fancy many conveniences and benefits, in ignorance of the fact that higher living standards await them in rural areas. Children reared in cities ordinarily remain urban because they know no other life. Urbanization not directly related to industrial or commercial needs is probably to a great degree dependent upon inertia and unwillingness of city dwellers to adapt themselves to change in living habits. Doubtless excessive urbanization is in part a cultural phenomenon that defies rational explanation.

Australia's potentialities for future development have been grossly exaggerated. Much of the arid interior can never be more productive than it is now. Possibly the humid north and northeast coasts can be pushed to greater yield. The prospects of great industrial expansion are not bright. There is a shortage of certain basic minerals, notably iron and coal. Hydroelectric potential is high only in Tasmania. Petroleum production is virtually nil. Timber has long been an import. Isolation is a handicap to securing a share of highly competitive markets.

It seems agreed that 30 millions is the maximum



Street scene, Brisbane (U. S. Army photograph)

population that can be supported at a high standard of living. Whether Asia's teeming hordes will be satisfied to leave Australia a white-man's reserve is doubtful. One attempted invasion was beaten off. Others will most certainly come. Australia's effectively all-British immigration policy is not calculated to fill the continent to population capacity. Rather it will most certainly lead to decline in numbers when the present preponderance of youthful age groups is past. The only solution is to permit a heavy influx of prolific southern and eastern Europeans who are prepared to pioneer on a subsistence basis. This the Australians refuse to sanction.

New Zealand. While New Zealand properly belongs in the Australian realm of the Pacific World, it is a distinct entity that should not be confused with the larger land to the west, Australia. The distance between the nearest points of Tasmania and New Zealand is nearly a thousand miles across open sea. New Zealand's area of over 100,000 square miles leaves it but slightly smaller than the whole of the British Isles. Furthermore, New Zealand is an independent member of the British Commonwealth. With its mild, humid marine climate, active volcanoes, and high, glaciated mountains, New Zealand bears little natural resemblance to Australia. That the two countries have developed along somewhat similar lines is to be attributed to a common cultural heritage and antipodal location.

New Zealand broke into the commercial world when sealers, traders, and whalers began to frequent its waters and coasts in the late eighteenth and early nineteenth centuries. English missionaries were established on the northern tip of North Island in 1814. They urged the British government to claim the islands, but got no response until France showed an interest in them. Then simultaneously in 1840 Britain formally annexed New Zealand and the first settlement was made, at Wellington, on the southern tip of North Island. Additional colonies were established, at Dunedin in 1848, and at Canterbury in 1850, both on South Island. In contrast to early colonization of Australia by convicts, the latter two of the first three New Zealand settlements were church sponsored.

Early European settlement favored North over South Island, despite the greater concentration of Maori on the same island. Between native Polynesian and European there was a series of bloody, bitter wars. The white man was inevitably victorious. The Maori were so reduced in number and beaten in spirit as to suggest their ultimate extinction. However, today they have recovered numerically to constitute over 116,000 of New Zealand's 1.9 million total population. They have

adapted themselves to new ways, and at the same time there has been a healthy revival of old arts and crafts. Economically the Maori fare well on their own lands, where they demonstrate a successful system of cooperative agriculture and pastoralism.

The early settlers brought the familiar English grains, sheep, and cattle to favorable ground. Soon they were exporting wool, and a flurry of prosperity followed a big demand for grain during the Australian gold rushes of the 1850's. During the 1860's New Zealand experienced feverish gold mining on both its islands. Wheat became a bonanza crop, especially on the Canterbury Plains of South Island, in the 70's and 80's. Wheat then lost out to unmeetable competition in the export market, but a new export of frozen meats was there to take wheat's economic place. During the twentieth century the most notable development has been in dairying and the export of dairy products.

Today New Zealand is above all a dairying-pastoral country. Both reach greater intensity of development on North Island. The Canterbury Plains of South Island still produce wheat, now frequently insufficient for New Zealand's needs. For the whole country the leading exports in order of importance are butter, wool, and frozen meats. Far less in value are cheese and hides. Field crops do not enter the list of important exports.

There is no unoccupied farm land in New Zealand. Particularly in lowlands, away from mountains, the pastoral countryside is idyllic, and it is strangely familiar to one who has seen rural England. Imported grasses and trees are the setting for English-type houses and European breeds of sheep and cattle. Well-tilled fields produce mainly feed for stock. There are apple orchards, but the fruit is largely reserved for home consumption.

Beyond the agricultural and pastoral economy there is little. Mining is unimportant. Increasing coal mining, particularly on South Island, is still insufficiently productive to meet demand. However, all power needs can easily be satisfied by the high hydroelectric potential of South Island.

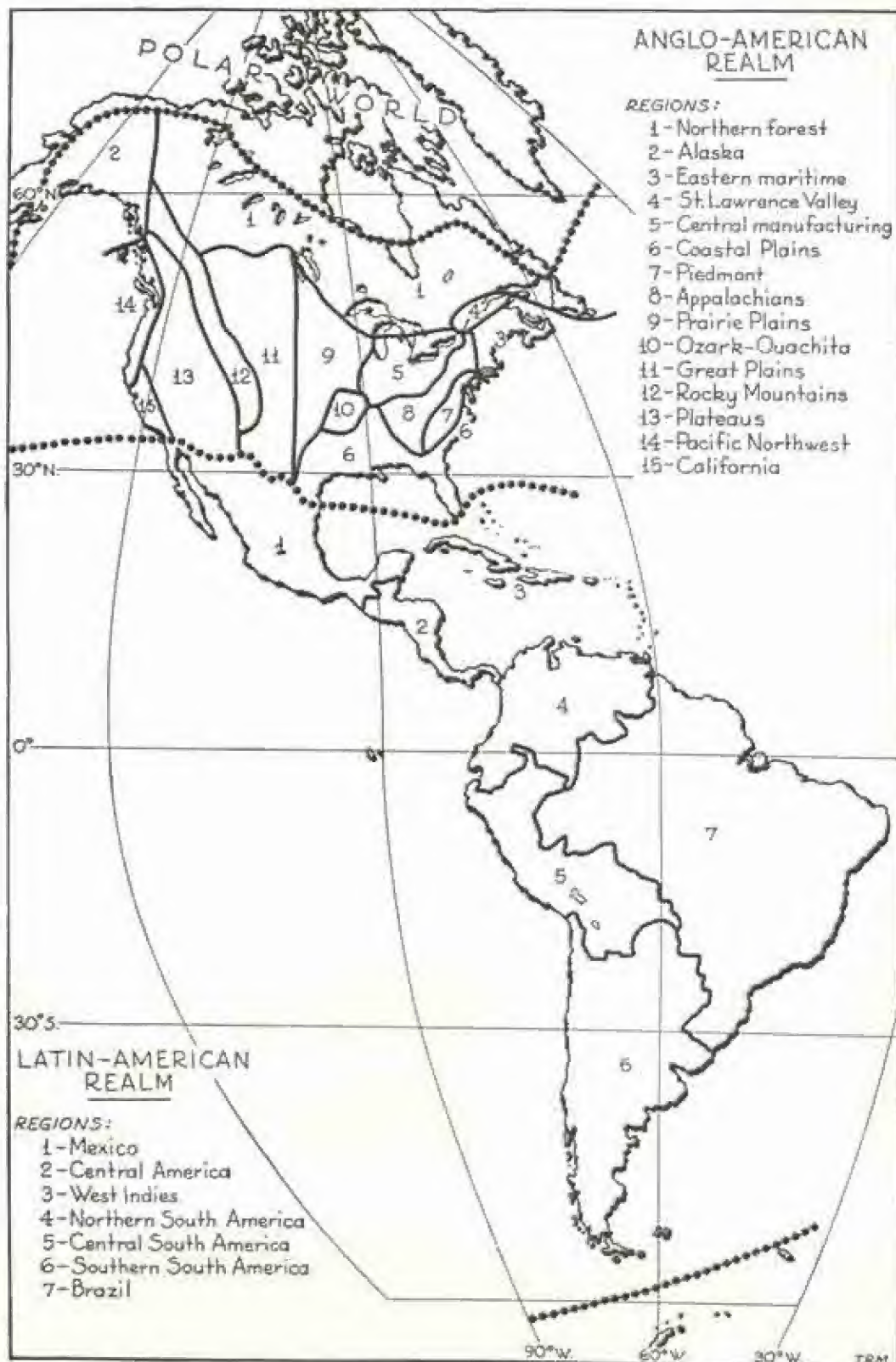
There is a large industry concerned with processing, packing, and shipping dairy and pastoral products. Pure manufacturing is limited to engines, implements, windmills, fertilizer, and other goods used on farms. The railroad pattern is one that fits the needs of an agricultural country, no part of which is far from the sea.

Yet New Zealand is over half urban. Auckland, which lies in the middle of the nation's most

productive agricultural district, is the largest city with its 308,000 inhabitants. Wellington, also on North Island, and Christchurch and Dunedin on South Island approach populations of 200,000. Some ten other cities have between 10- and 30-thousand inhabitants.

Should other Pacific World regions seek a model to guide their development, they might well select New Zealand. There a pastoral and agricultural economy affords a comfortable and healthy, if not always a luxurious, existence. Furthermore, New Zealand has been extremely progressive in developing social and economic democracy.

AMERICAN WORLD



American World: realms and regions

51: Natural Setting

ORIENTATION

North and South America are part of the New World in the same sense that South Africa, Australia, and New Zealand are. During the last 400 years Europeans and European cultures have conquered this part of the New World, submerging the aboriginal inhabitants, the American Indians. It is true that there are sections where Indians are still and will probably remain racially dominant. There are areas where Indian cultures are as yet little touched by the European invasion. But everywhere European cultures, themselves modified by time and borrowing, are making their seemingly inevitable expansion into the last pockets of aboriginal life.

Another New World characteristic that goes with the extinction of native cultures is the frontier attitude with regard to natural resources. The extermination of wildlife species, and a prodigal waste of soil, forests, and minerals have marked the expansion of European settlement. Only recently has there come a general realization that nature provides no limitless reservoir of wealth, and that careful husbandry is the only alternative to eventual poverty.

A third New World trait is the fact that there are still sparsely populated areas, areas that could support dense populations living up to European standards by practicing intensive European methods of utilization. Such areas are a powerful attraction to the overpopulated sections of the Old World. The gates were once open to settlers from all lands. While many American nations wish to see their vacant lands populated, they are increasingly critical of the qualifications of immigrants.

The natural setting of this last-considered portion of the New World is tremendous in extent and varied in composition. A continuous land mass reaches from 72° N. to 54° S., a straight-line distance of nearly 9,000 miles. Both North and South America have a maximum east-west width of some 3,000 miles. At the other extreme is the Isthmus of Panama, where a 30-mile breadth and favorable natural conditions made possible an artificial severance between the northern and southern land masses that approximates the boundary between North and South America.

It has been said that the accepted division between North and South America is largely a convenient fiction of the cartographer. It is pointed out that there is continuity of natural conditions between the two continents; that the Gulf of Mexico and the Caribbean Sea, the "American Mediterranean," unify rather than separate the lands bordering their shores. However, there are two continental masses according to every definition of the term. The Panama-Colombia boundary separates them far more logically than does any line drawn between Europe and Asia, and it is quite as good as the line dividing Africa from Asia. Prior to the independence of Panama from Colombia, the northern boundary of the former country was the accepted division between the two continents.

There is no logical line of separation through the Caribbean. Established practice throws the Antilles with North America, even the island of Trinidad, within sight of the continent of South America. The islands are often separately grouped as the West Indies. The seven small countries and the southernmost states of Mexico occupying the narrowest portion of North America constitute a distinct division, Central America. The term *Middle America* is often employed to include Mexico, Central America, and the West Indies.

In the present treatment, which divides the world on the basis of cultural differences, the logical division of the Americas agrees with none of those considered above. New World cultures are modified European cultures, but they have different European antecedents. North of Mexico the United States and Canada constitute the Anglo-American Realm. Here the common tongue is English, the dominant religion is Protestant Christianity, and political and social, as well as economic practices reflect those of northwestern Europe. There is marked development of industrialization and urbanization. South of the United States is the Latin-American Realm. Spanish and Portuguese, the dominant tongues, are derived from Latin. Roman-Catholic Christianity is overwhelmingly the major religious faith. Laws and customs are drawn from the countries of southwestern Europe. Urbanization and industrialization are as yet in their infancy.

SPACE RELATIONS

North America ranks third in size among the continents, with its 8,300,000 square miles. Only Asia and Africa are larger. Its over-all latitudinal extent is over five thousand miles, ranging from 8° N. to 84° at the northernmost tip of Greenland. It is noteworthy that the continent lies entirely north of the equator, with the great bulk north of the thirtieth parallel. The northern margin of the mainland is marked approximately by the seventieth parallel. Thus North America is predominantly a middle-latitude continent, exhibiting the natural conditions inherent in such a position.

North America is roughly bisected longitudinally by the hundredth meridian. This means that the center of the continent is over a quarter of the distance west around the globe from the Greenwich prime meridian. Even at the high-middle latitude of New York there is a stretch of about 3,000 miles of open water along the shipping routes to Europe.

Between East Cape, Siberia, and Cape Prince of Wales, Alaska, the distance is only 36 miles, interrupted in the middle by the Diomed Islands. At the present time this close proximity of the two continents is of little importance because of rigorous natural conditions. The Pacific widens rapidly southward. Two-thousand miles of open sea separate San Francisco from Hawaii. It is 5,500 miles from San Francisco to Yokohama. From Panama to Auckland, New Zealand, the distance is 6,000 miles. Like other important sections of the New World, North America is remote from the Old World.

North America is sufficiently irregular in shape to rival Australia and Europe in proportion of coast line to total area. However, much of the irregularity comes in high latitudes of little utilization, where the benefits of climatic tempering and water routes reaching far inland are of little or no importance. The continental shoreline has sufficient minor irregularities to provide an abundance of excellent harbors. Portions of the Pacific coast are an exception to this general rule. There recent geologic uplift has left straight shorelines and good natural harbors are few.

The whole continent reveals a well-developed pattern of interior waterways of varying degree of present or potential utilization. The major continental water divide follows the crest of the Rocky Mountains, thus separating the drainage areas into two unequal parts, a smaller, relatively rugged

section draining westward, and a broad, largely plains section draining generally eastward.

From north to south the major westward-draining systems are the Yukon, Fraser, Columbia-Snake, Sacramento-San Joaquin, and Colorado. East of the Rockies, also from north to south, are the Mackenzie, Saskatchewan-Nelson, Great Lakes-St. Lawrence, the Mississippi-Ohio-Missouri, and the Rio Grande systems. The narrower and smaller area of Mexico and Central America has no drainage system comparable in size with those mentioned above.

South America, with its 7,700,000 square miles, ranks fourth in area among the continents. Its latitudinal span is from 13° N. to 55° S. The broadest east-west expanse lies not far from the equator. The Tropic of Capricorn fairly bisects the continent latitudinally, but leaves the great breadth of land to the north. Thus South America, in marked contrast to North America, lies in major part within the tropics.

The meridian of 60° halves South America in an east-west direction. This position means thousands of miles of open sea across the South Pacific to Australia and New Zealand. Across the Atlantic, however, the distance from the bulge of South America to the bulge of Africa is less than 2,000 miles, and from the same point in South America to the ports of southwestern Europe the sailing distance is only some 3,000 miles along a great-circle route that is never more than a thousand miles from land.

It is generally assumed by North Americans that South America lies directly to the south. Yet the truth is that a line drawn due south from Florida approximates the westernmost point of South America. Ports on the east coast of South America, south of the bulge, are closer to Spanish ports than they are to New York. West-coast South American ports are closer to New York via the great-circle Panama-Canal route than they are to San Francisco. The importance of South America's relative closeness to the eastern hemisphere has been emphasized in recent years through increasing use of the short route by airplanes.

South America is exceedingly regular in outline, the proportion of coast to area being less only for Africa. There are no long arms of the sea to carry temperature modifications and ships inland. In minor detail the coast line is regular, resulting in a general scarcity of good ports. As in North America, the east coast is reasonably well provided with harbors; along the west coast they are few. The fiorded coast of south Chile provides magnificent natural harbors, but the area is sparsely populated and largely unutilized.

Even more than in North America, the great continental water divide, the crest of the Andes, lies close to the western margin of the continent. The major streams and plains lie to the east. The Amazon river system is so large as to dwarf all others of the continent, just as the Mississippi system does in North America. The headwater streams of the Amazon rise to the east of the Andean crest, then drop sharply to a basin that stands only a few hundred feet above sea level. Large ocean-going vessels ascend the Amazon to Manaus, a thousand miles from the Atlantic. Smaller steamers navigate with little difficulty to the very foothills of the Andes. North of the Amazon is the Orinoco, a river subject to marked seasonal variation in volume, but still navigable by river steamers for a distance of some 900 miles above its mouth. South of the Amazon is the La Plata system, of which the Parana is the major river. The latter is navigable by river steamer to Asuncion, Paraguay.

The rivers of the western slope are short and of small volume. In addition many of them flow through exceedingly dry country where they lose rather than gain volume. Neither an eastern nor a western stream is the Magdalena, which flows between the bifurcated Andes northward into the Caribbean. This stream is navigable with difficulty to Neiva, Colombia, nearly 600 air-line miles above its mouth.

MAJOR SURFACE FORMS

In broad plan there is striking similarity in build between the two American continents. Both have a western cordillera, ranges of high, still actively changing mountains. Both have old, worn-down, comparatively stable uplands to the east. And both continents have lowlands of intermediate geological age lying between mountains and uplands.

In detail the broad similarity between the two continents is lost in a maze of differences. For convenience in description three major areal units are recognized: northern North America, Middle America, and South America.

North of Mexico, in northern North America, there are two well-defined systems of mountains. Easternmost of the two is the Rocky Mountain system. The Rockies begin with the Sangre de Cristo Mountains of northern New Mexico, and extend northward through the United States and Canada to the Brooks Range of northern Alaska.

The Pacific mountain system parallels the coast, never more than a few hundred miles inland. An inner belt of mountains is formed by the Sierra

Nevada, the Cascades, the Coast Mountains of British Columbia and Alaska, the Alaska Range, and the far-flung arc of the Aleutian Islands. Another line of far-less-impressive mountains flanks the immediate Pacific coast. This belt includes the Coast Ranges of California, Oregon, and Washington; the outer islands of the irregular British Columbia-Alaska coast; and Kenai Peninsula.

A series of valleys and depressions lies between the two belts of Pacific mountains. Among them are the Valley of California, the Willamette Valley of Oregon, the Puget Sound depression, the Inside Passage to Alaska, and Cook Inlet. The valleys are of great importance agriculturally, since they occur in a region where a coastal plain is largely nonexistent.

Plateaus of various sizes and descriptions occupy the broad corridor between the Rockies and the mountains of the Pacific system. To the south are the Colorado Plateaus and the Great Basin. In succession northward are the Columbia Plateau, the plateaus of British Columbia, and the Yukon Plateau in northwestern Canada and Alaska.

The character of the land east of the Rockies is very different. Plains extend from the mountains to the Atlantic, and from the Arctic Ocean to the Gulf of Mexico. They have in common a comparative flatness and low relief. They vary individually from the high plains just east of the Rocky Mountains to the lowlands of the Mississippi basin, and from the glaciated ancient land mass of the Canadian Shield to the young, non-glaciated Gulf and Atlantic Coast Plain.

Isolated patches of hill land interrupt the continuity of the plains, and hill lands make up most of the Appalachian region. True mountains, in general far more subdued and softer in contour than the western ranges, are found only in the extreme southern and northern portions of the Appalachian oldland. The one range of really high mountains east of the Rockies is in northern Labrador. There sharp peaks and abrupt declivities are the result of ice sculpture.

The diversified geologic history of North America is reflected in mineral resources that for variety and abundance probably entitle the continent to first rank. The supply of minerals essential to modern industry, such as coal, iron, petroleum, silver, gold, zinc, lead, copper, and nickel, is ample. There is a notable deficiency of tin, bauxite, and some of the rarer metals.

The regional segregation of minerals is naturally in accordance with variation in geologic



American World: natural features

history. Coal and petroleum are in general associated with the plains areas of sedimentary rocks lying east of the Rockies. Gold, silver, and copper are mined in the western mountains and from the old rocks of the Canadian Shield. In the latter area are the major deposits of iron, nickel, and radium ore.

Middle America provides a naturally continuous land connection between South America and northern North America, but its structural relations to the larger land masses are rather incidental.

The Andes end in South America. The narrow isthmus lying between Colombia and the lowlands of Nicaragua is composed of a series of generally northwest-southeast-trending folded mountains, surmounted at intervals by active volcanoes. This is a region of rough terrain, with plains reduced to minor importance.

From the Nicaraguan lowlands to southern Mexico the structural trend is east and west. This trend is apparent on the Caribbean coast, where it outlines valleys and ranges that plunge beneath the sea, to reappear in the Greater Antilles. On the Pacific side the underlying structure is obscured by a thick mantle of ash and volcanic flows, forming a high plateau in which valleys and basins are nestled among volcanic peaks. With one exception lowland plains are again of minor importance. The lone exception is the Yucatan peninsula, a low, featureless limestone plain.

Mexico north of the Isthmus of Tehuantepec may be described simply as a plateau bounded on the east by the Sierra Madre Oriental and on the west by the Sierra Madre Occidental. Further detail shows the plateau to be composed of a great number of basins, depressions, and mesas, separated by rough

hilly country. Flanking Mexico's northwestern mainland coast is the long depression occupied by the Gulf of California, set off by the rough and rocky peninsula of Baja California.

The Greater Antilles are part of the east-west structures previously mentioned for Central America. They are largely the exposed tops of mountain ranges whose bases lie far below sea level. The structural trend may be traced in a single range from the Virgin Islands to the Cordillera Central of the Dominican Republic. West of this mountain knot there is a bifurcation. One structural line gives rise to the northern prong of Haiti, the Sierra Maestra of Cuba, and the islands of the Cayman group. The other is represented by the southern peninsula of Haiti and Jamaica.

The Lesser Antilles are an arc of volcanoes, some actively building, others eroded or submerged. A secondary feature is extensive coral



North America: mineral deposits

growths, producing coral terraces or collars on emerging islands or reefs, and atolls in areas of submergence. The southernmost islands of the group, notably Barbados and Trinidad, belong structurally to continental South America rather than to the Antillean arc.

Striking natural features of Central America are three comparatively easy passages between Atlantic and Pacific waters.

The Isthmus of Tehuantepec is the northernmost of the passages. The over-all distance between Atlantic and Pacific is some 130 miles and the maximum elevation is about 800 feet. A railroad between the two coasts was built 40 years ago, but the route has never become important commercially.

The middle passage utilizes the lowland of Nicaragua. The San Juan River provides fairly easy ascent from the Caribbean to Lake Nicaragua, with its elevation of slightly over a hundred feet. In colonial days this route to the lake was followed by the sailing vessels of the time. Deepen-

ing of the stream to fit modern ships would be no great engineering feat. Neither would it be difficult to excavate a channel through the hills bordering Lake Nicaragua on the west, thus completing the water route to the Pacific.

The third and long-most-significant passage is that across the Isthmus of Panama. A break in the mountainous backbone of Central America, a minimum distance of thirty miles, and a maximum elevation of less than 300 feet provide a situation appreciated ever since the days of Balboa. Transportation by mule back was succeeded in 1850 by a railroad. In 1914 the Panama Canal was completed, with its immense saving in distance over the Cape Horn route.

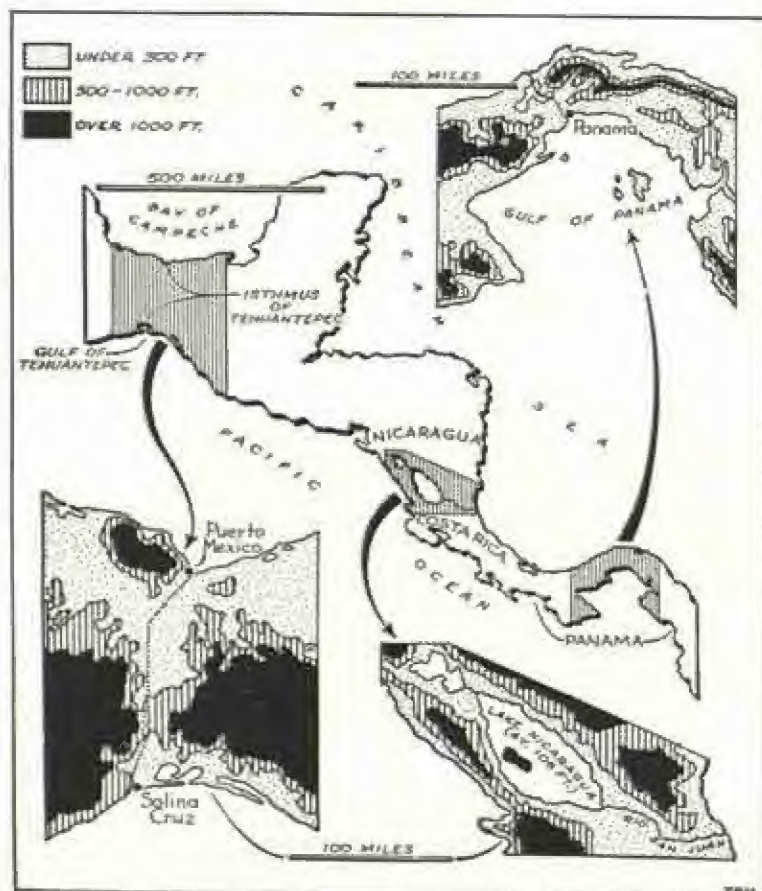
Portions of Middle America are heavily mineralized. Mexico was one of the original *El Dorados* of the Spanish conquerors. It continues to yield the gold and silver that were of early importance. To these two, copper, mercury, and petroleum have been added in more modern times. The mining of placer gold rises and falls with the economic conditions throughout most of Central America. Cuba contributes iron and manganese

ores to North American industry. Coal is a major deficiency in Middle America, just as it is in South America.

South America, with its young mountains, plains, and old mountains, marks a return to the general conditions described for northern North America.

The Andes are among the most impressive mountain systems of the earth. No other extends so far at such constantly great height. The average elevation of the Andes is far greater than for the mountains of North America. Even the relatively easier passes reach 10,000 feet. Abrupt rather than gentle slopes mark the contact between mountain and lowland.

The Andes are rarely a



Central America: natural crossings

single chain. An average width of 200 miles is increased to 400 in Bolivia. The southern Andes are by comparison narrow and compact, with one main range that has the highest individual peak and the lowest average elevation of the entire continental system. The southernmost mountains, from about 44° southward, are heavily glaciated, exhibiting the fiords, lakes, sharp peaks, and other features resulting from ice sculpture.

The central Andes are extremely complex. There are innumerable ranges, frequently enclosing high plains or plateaus; knots or clusters of mountains and volcanic peaks; and deep canyons cut by streams flowing eastward to the lowlands.

In southern Colombia the Andes split into three ranges, between them the valleys of the northward-flowing Magdalena and Cauca rivers. The easternmost of the three ranges, the Cordillera Oriental, itself splits into two prongs that enclose the Maracaibo basin. Andean structure extends from the eastern side of the Maracaibo basin along the northern edge of Venezuela, finally to end in a low range in northern Trinidad.

Since the Andes hug the western margin of the continent, the coastal plain is narrow or non-existent. The central and southern Pacific coast of South America shows many striking similarities to the west-coast regions of North America. There are the same low coast ranges, important interior valleys, and scarcity of good harbors in middle latitudes; while southern Chile matches the rough and irregular fiorded coast of British Columbia and Alaska.

East of the Andes are the major lowlands, comprising nearly half the total area of South America, but still proportionally less than in North America. The lowlands share a common geologic background of thick marine deposition mantled by continental deposits. They are low in elevation—largely under a thousand feet—and ordinarily have little local relief. In detail they vary significantly.

To the north are the low plains or *llanos* and the delta of the Orinoco, separated by an almost imperceptible divide from the Amazon basin. The latter is low, only some 350 feet above sea level at a distance of 2,000 miles inland. The valleys of the innumerable streams that make up the Amazon system are subject to seasonal flooding, but the more-extensive interstream areas are above flood waters. The divide is low between the Amazon basin and the plains drained by the Parana-Paraguay system. West of the Paraguay the plains are flat and featureless, lacking visible drainage forms. During the rainy season the surface is mantled by broad swamps; during the dry

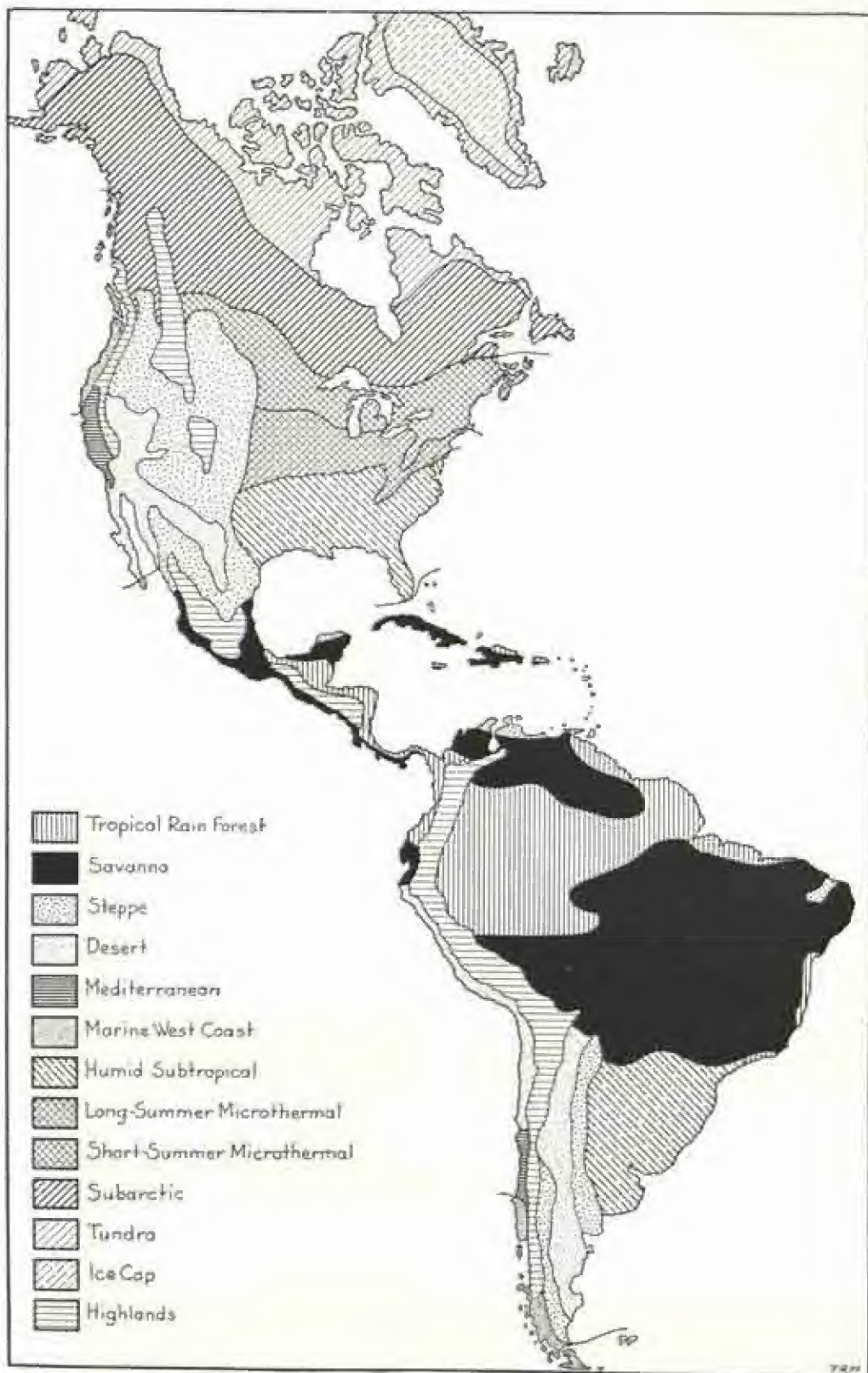
season water is difficult to find. Still further to the south lie the *pampas*, the southernmost, and at present the most significant, of all the lowland areas of South America. The pampas stretch for a distance of some thousand miles north and south. They present a low, uniform surface, with only minor swellings to create relief. The unconsolidated, alluvial surface covering is poorly drained by streams but is pitted by numerous small, shallow ponds.

Bordering the eastern margin of the continent are the three highland areas: the Guiana Highlands, the Brazilian Highlands, and Patagonia. Together they occupy such a vast territory that only an insignificant area remains as true coastal plain along the Atlantic.

The Guiana Highlands are still a little-known region. They are essentially a plateau through which project the ragged remnants of ancient mountains. The eastern side of the plateau is a steep *escarpment*; over it plunge a number of streams, producing scenic waterfalls and wild rapids. Beyond the escarpment to the east lies the



South America: mineral deposits



Western Hemisphere: climates

lowland of the Guianas, the most considerable coastal plain of the continent.

The Brazilian Highlands are similar in character. They average some 2,000 feet in elevation and are composed of a series of plateaus intermingled with the protruding roots of old mountains. The Highlands extend to the sea in a precipitous border, leaving but narrow fragments of coastal plain.

Patagonia is a tableland averaging about a mile in height. It is composed of older rocks, lavas, and younger sediments. Knobs of resistant rock rise above the comparatively flat general surface. Eastward-flowing streams have cut deep canyons whose bottomlands offer far more habitable sites than do the broad, barren, wind-swept surfaces of the upland plateau.

With the notable exception of coal, South America is more than adequately provided with minerals. The Guiana Highlands are important for gold and diamonds, while the Brazilian Highlands produce gold, diamonds, and copper, and have perhaps the best large remaining deposits of iron ore in the world. The Andean regions yield silver, copper, tin, platinum, gold, iron ore, and other important minerals. The desert of northern Chile has the finest natural deposits of nitrates, now of reduced utilization because of technical advances making it possible to fix nitrogen directly from the air. Venezuela ranks second or third among the countries of the world as a producer of petroleum. Expert opinion predicts a general extension of petroleum production to the lowland region lying east of the Andes.

CLIMATE AND VEGETATION

Next to basic geologic processes, the natural agent most responsible for the appearance and condition of the earth's surface is climate. It affects the minor configuration and nature of the surface mantle of earth materials. In large measure the aspect of the natural covering of vegetation is a direct reflection of climatic conditions.

Up to a certain point the climatic and vegetational zones of the Americas are symmetrically developed north and south of the equator. Only in the higher latitudes do the greater breadth and farther poleward extension of North America introduce conditions which are not matched in South America.

Tropical, that is, winterless, climates largely coincide with the area lying between the tropics of Cancer and Capricorn. Secondary divisions are based on amount and seasonal distribution of precipitation. Significant modifications of tropical temperatures are produced in highland areas that

rise to heights of about 3,000 feet or more above sea level.

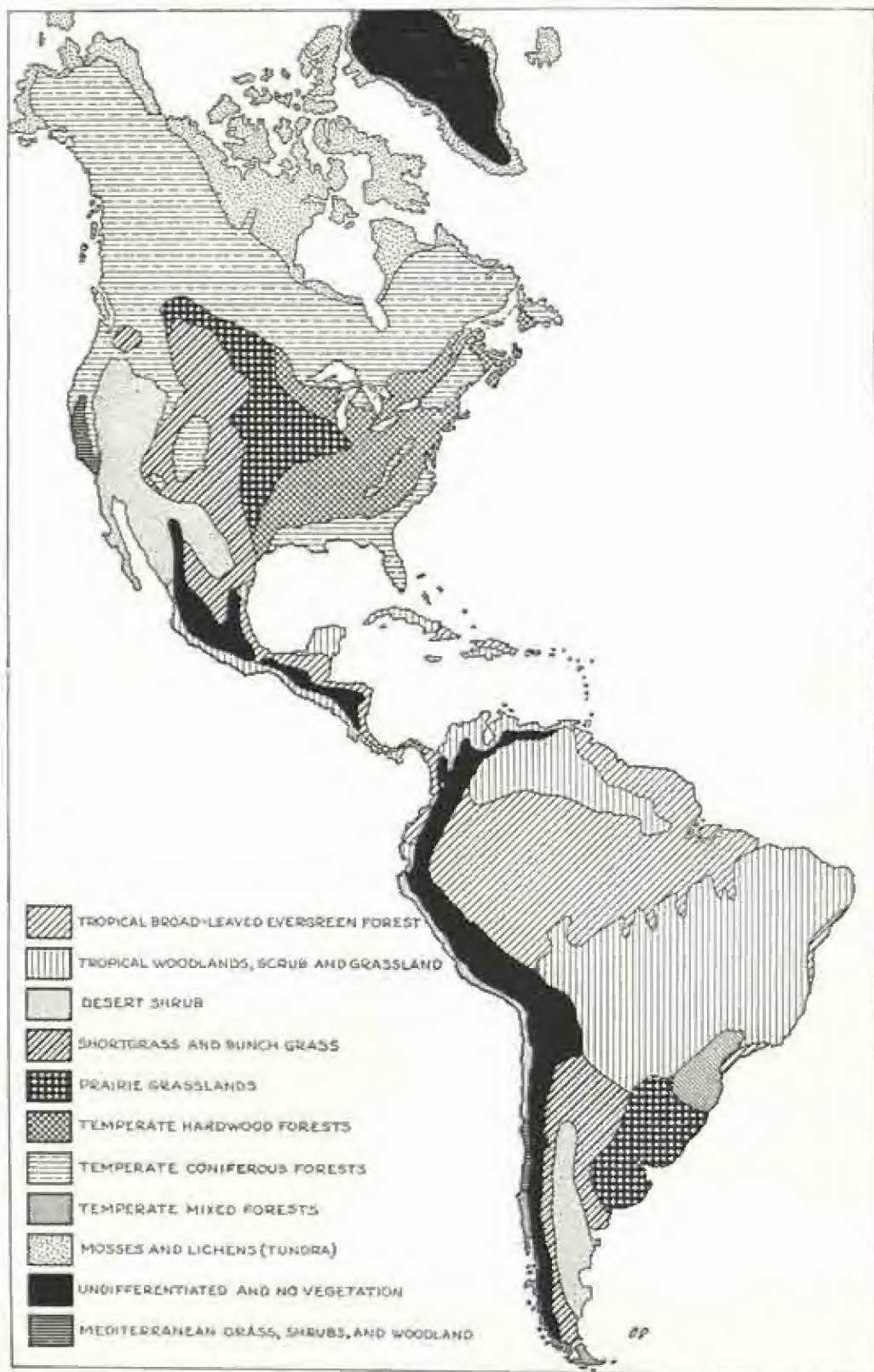
The largest area of tropical rain forest in the world, the *selva*, sits astride the equator in the Amazon basin. It is the central core about which the climatic symmetry of the Americas is developed. The American rain forest, like that described for Africa, has a climate marked by high annual temperature and high annual precipitation, with comparatively little seasonal variation in either. The vegetation cover in its extreme development is a forest composed of broad-leaved evergreen trees, with a foliage so dense and continuous as to obscure the ground and prevent the appearance of undergrowth. Certain domesticated plants find optimum conditions in rain forest climates. Bananas, cacao, and rubber do best with constantly high temperatures and rainfall. The largely untouched tropical rain forest is the world's great reserve of hardwood timber.

While the major area of rain forest is concentrated in the Amazon basin, there are extensions of similar climatic conditions poleward on the eastern continental margins to the very limits of the tropics. These extensions are due to windward exposure to prevailing trade winds, particularly where highlands force the moisture-bearing air currents upward.

Lying symmetrically on either side of the rain forest are the savanna climatic and vegetational zones. Savannas are still winterless as far as temperature is concerned, but they have less rainfall than do rain forests and the winter season is dry. The natural vegetation cover is semi-deciduous forest, open woodland, or grassland, depending upon the amount of precipitation. Savanna climatic conditions favor the production of domestic plants such as coffee, sugar cane, and cotton—crops that profit from a dry season while maturing and being harvested.

The two major savanna areas of America center on the llanos of Venezuela and the campos of Brazil. Savannas appear on the western or Pacific side of mountain barriers in Middle America and they also reach the windward eastern coast where the lands are low in elevation.

Of great importance to man are areas in Middle and South America where highland elevations modify the prevailing tropical temperatures. The Spanish-speaking inhabitants of these areas have a series of names which they apply to the vertical zonation of climatic conditions. In equatorial latitudes elevations up to 2,000–3,000 feet are *tierra caliente*, where lowland temperatures and rain-forest plants are encountered. *Tierra templada*



Western Hemisphere: vegetation

extends from this zone up to elevations of around 6,000 feet. Temperatures average between 65° and 75° F., and coffee, maize, and cotton are typical products. The *tierra fría* zone is next in order. It extends upward to 10,000 to 11,000 feet, where temperatures average between 55° and 65° F., and frost and snow are not unknown in latitudes such as those of the Mexican plateau. Characteristic crops are in keeping with natural conditions: wheat, apples, barley, and Irish potatoes. Still higher zones are variously named in Spanish-American countries. A tundra-like zone succeeds the *tierra fría*. An average temperature below 50° is too low for agriculture or forest, and leaves limited grazing the only form of utilization. Still higher, at elevations in excess of 14,000-15,000 feet, are barren areas of permanent ice and snow.

The American tropical highlands have played an important part in human developments. They were the sites of advanced Indian cultures, and for Europeans they have provided favorable natural conditions within the limits of the tropics.

Lying only partially within the tropics are the arid steppes and deserts, where deficiency of precipitation is so important as to outweigh all other climatic qualities. As on other continents, arid climates reach the west coasts of the Americas, extending equatorward from latitudes of about 30 degrees. In North America steppes and deserts expand inward and poleward to include most of the intermontane plateaus of the United States, and the western Great Plains northward to the Saskatchewan River. In South America the coast of Peru and northern Chile is arid. A stretch of dry Andean highlands marks the extension of steppes and deserts to the lowlands of Argentina.

Even the Patagonian plateau is arid, providing a rare instance where dry climates reach the east coast of a continent. This unusual situation is at least in part to be attributed to the rain-shadow effect of the high Andes in an area where the land is narrow.

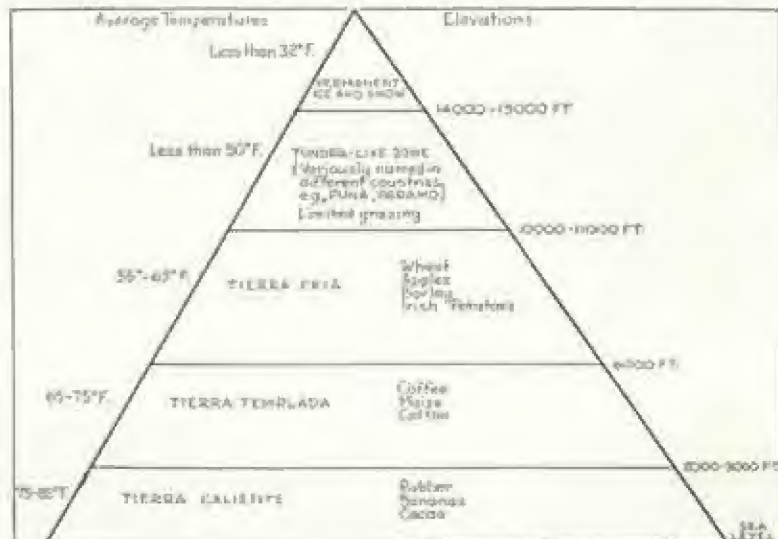
The arid areas of the Americas show the custom-

ary natural specialization and limited utilization resulting from scanty precipitation. Deserts develop a distinctive surface made up of steep topography, where bedrock occurs at the surface; interior drainage; and extensive alluvial fills; and are mantled by a sparse and highly specialized vegetation. They offer limited grazing, and an oasis agriculture where water and arable soils happen to coincide.

Steppes are normally grasslands, varying from a closed cover of short grass on the humid margins to bunch grass where the desert limits are approached. The grasslands provide range grazing, and, particularly in middle latitudes, are a tenuous extension of the great cereal-producing agricultural belts.

Extending poleward from the dry climates on the Pacific margins are two small but distinctive and significant climatic areas. Middle Chile and the larger part of California are the American representatives of Mediterranean climates. Summers are desert-like, with marked dryness and even the prevalence of coastal fogs. Winter rainfall is sufficient in amount to escape classification as an arid climate, and average winter temperatures are low enough to be non-tropical. Even so, winters are warm for the average of the latitude, and subtropical crops, such as olives and citrus fruit, can be grown successfully despite occasional frosts.

The Mediterranean landscape is distinctive, largely because of its characteristic vegetation. Valleys commonly support a cover of grass with widely spaced trees. Dry hillsides bear a scrubby dense growth commonly termed *chaparral* or



Tropical America: altitudinal zones

maquis. True forest is found only under special conditions, generally at high elevations of greater precipitation, and thus falls outside the limit of true Mediterranean climate.

Adjoining the Mediterranean areas and extending poleward to the southern tip of South America and nearly to the parallel of 60° in North America are the marine west-coast climates. These climates, as the name indicates, are coastal and they lie on the westward or windward side of the continents. The resultant conditions mean a climate having cool summers and winters exceedingly mild for the latitude. The windward exposure favors heavy precipitation, particularly since mountain barriers rise abruptly from the coast in both North and South America. With elevation the winter precipitation comes in the form of snow which, combined with cool summers, gives rise to extensive accumulations of glacial ice in the bordering mountains. On the poleward margins of both areas glacial tongues discharge directly into the sea. Fiords and other evidence of ice action indicate that glaciers were even more extensive in the past.

Both marine west-coast areas are heavily forested with excellent timber trees. The North American coast extending from California to southern Alaska is today the principal source of commercial timber for the continent.

The humid subtropical is the remaining climatic type common to both North and South America.



North America: continental and polar climates

In North America it is roughly the region lying south of the Ohio River and east of the 100th meridian, the "South." In South America it includes the humid pampa of Argentina, Uruguay, the southernmost states of Brazil, and a portion of Paraguay.

Climatically the humid subtropical is distinguished by long hot summers and mild open winters. The seasonal extremes of temperature are most marked in North America and less so in South America, where the area is smaller and the tempering effect of the sea more evident. In both cases precipitation is abundant and fairly evenly divided seasonally. The climate is highly favorable in many respects for agricultural production. Within its limits there is a great variety of crops, from citrus fruits, sugar cane, and cotton, to maize and wheat.

The climatic qualities of the humid subtropical are in general such as to favor forest growth, but grasslands are prominent in the vegetation cover. Particularly is this true in the South American section. Some students think the grassland condition was induced by annual burning on the part of the aboriginal Indian hunters.

Beyond the humid subtropical there is an end to the symmetry of climates on the two sides of the equator. The marine west coast of South America gives way gradually to polar climates: there is nowhere in the continent a climate similar to that found in the North American Corn Belt. The climates lying between humid subtropical and tundra in North America are those that develop only on extensive land masses of high-middle latitudes, since the great seasonal extremes of temperature that characterize them are impossible where the tempering influence of the sea is dominant.

With the continental climates of North America the length of the growing season, that is, the interval between the last killing frost of spring and the first killing frost of fall, is a matter of prime importance. The three continental climates, long-summer microthermal, short-summer microthermal, and subarctic, are distinguished largely on this basis. The climatic boundaries approximate significant crop boundaries.

The long-summer microthermal lies between the Ohio River and a line passing through the lower Great Lakes. It extends eastward from the 100th meridian to the Atlantic seaboard. Summers are warm to hot, with an average growing season of some five months. Winters are mild to cold, with many fluctuations above and below the freezing point. Precipitation is adequate and it is fairly well distributed through the year.

The long-summer microthermal is a forest cli-

mate, with a typical composition of broad-leaved deciduous trees. However, its western part was a tall-grass prairie at the time of settlement by Europeans. It is still a question as to whether the prairie was natural or induced by Indian burnings.

The southern boundary of the long-summer microthermal is the effective northern limit of cotton cultivation, while its northern boundary agrees roughly with the poleward extent of maize and the vine. The prairie portion is frequently called the Corn Belt, and it is agriculturally the most productive extensive area in the Americas.

The short-summer microthermal occupies a relatively narrow belt approximating the latitudes of the upper Great Lakes. It includes northern New England and maritime Canada at the east; at the west a long arm reaches to the Rockies, north of the Canadian steppe. This region is distinguished climatically from the preceding chiefly by its longer and colder winters. Conversely, the growing season is reduced to around a hundred days and hot spells of summer are rarely of long duration. Precipitation is reduced in amount but is still fairly evenly divided seasonally. Winter snowfall is the maximum for the eastern part of the continent.

A forest composed principally of broad-leaved deciduous trees gives way west of Lake Superior to tall-grass prairie. The latter is sometimes referred to as the Spring Wheat Belt. Because of the short growing season, maize is not a major crop; it is subordinate to hay, root crops, and small grains.

The subarctic reaches without interruption

from interior Alaska to Newfoundland. Its northern boundary is the poleward limit of forests, summerless polar climates, and the Polar World. Climatically, the subarctic is distinguished by reduced precipitation, long and very cold winters, and a short summer growing season. The severity of winter is no longer a matter of primary importance, for it sets the records for the continent. More significant is the degree of summer warmth. From a maximum of around a hundred days, the growing season is reduced to about thirty at the boundary with the tundra. While hot days do occur in midsummer, killing frosts may come in any month.

The subarctic supports the last poleward forest, the *taiga*. The trees are largely coniferous, pine, fir, or spruce, depending upon the degree of climatic restriction. On the southern borders are extensive forests of trees sufficiently large and numerous to be of commercial importance. Along the northern forest limit is the "land of the little sticks," where the trees decrease in size and density of stand before the forbidding character of the Polar World.

The climatic nature of the subarctic largely inhibits agriculture. Only in restricted areas especially favored by exposure, quality of soil, or other unusual condition, is successful agriculture possible.

Beyond the subarctic to the northward lies the region of true arctic or polar climates, the tundra and ice cap, described in detail in connection with the Polar World.

52: Indians and European Settlements

When Europeans "discovered" America in the latter part of the fifteenth century they found the two continents occupied by a people whom they mistakenly called Indians. No major section of the new lands was without inhabitants, but the population density was by no means the same throughout nor did it agree with the present-day distribution.

Estimates range from a conservative 8 millions to a generous 50 millions for the number of Indians at the time of Columbus. Whatever the true figure may be, it is certain that the most-densely populated areas were in Mexico, Central America, and Andean South America. It is also certain that Latin America's Indian population exceeded Anglo-America's bare million by a very large ratio, perhaps as high as thirty-five to one.

The common label of Indian applied to all the aboriginal inhabitants of America conveys a false impression of racial and linguistic unity and a uniformity of cultural attainment. The Indians were of rather ancient and diverse origin and by the time of Columbus had developed fundamental culture differences.

Present evidence indicates that the Indians originated in Asia and began the movement to America some 20,000 to 25,000 years ago, at a time of declining Pleistocene glaciation. The point of entry to the New World seems to have been Cape Prince of Wales, Seward Peninsula, Alaska, where the crossing from nearby Asia was no problem, even for a primitive people.

The first comers are believed to have been simple gatherers and hunters, so poorly equipped that they lacked even the bow. Racially they are judged by some to have been a small longheaded people, more nearly resembling brunet Caucasians than the Mongoloid type most characteristic of present-day Indians.

The first Indians may have arrived at a time when both the northern and southern coasts of Alaska were ice bound. However, the central portion of the Yukon Plateau escaped glaciation, and so provided a route into the interior. The movement of peoples was certainly no planned migration to settle a new land. It must have consisted of a slow, perhaps seasonal, progress of small unorganized driplets.

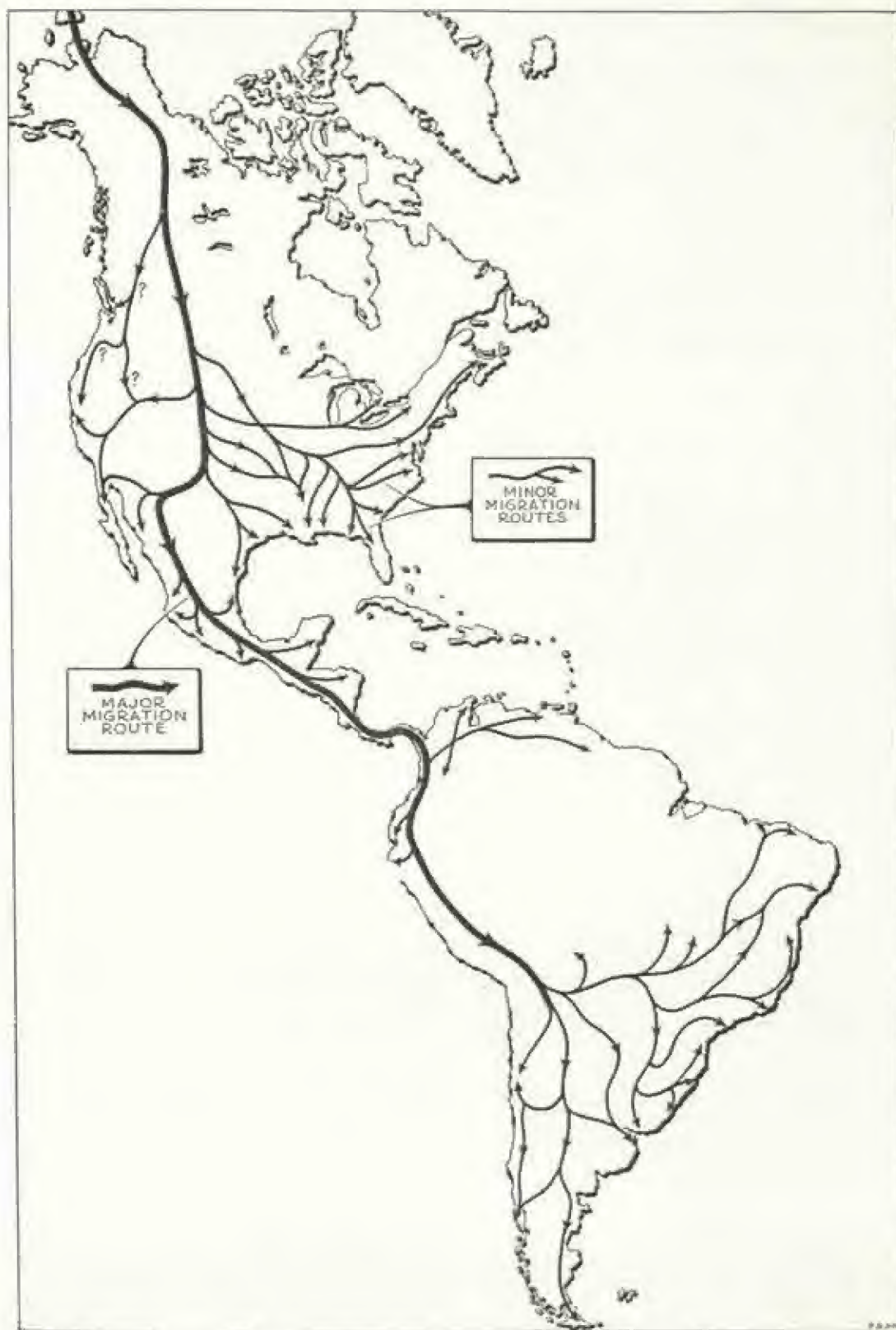
From the Yukon Plateau the best available route into the continental interior was along the western margin of the Great Plains, east of the Rocky Mountains. First use of this route likely came at a time when eastern Canada and the western mountains were still covered by glacial ice. Once south of the forty-ninth parallel there were opportunities for both eastern and western spread. However, the main line of migration appears to have continued south around the end of the Rockies, thence along the western margin of the plateau of Mexico.

The way was fairly easy along the highlands of Central America. Somehow the difficulties of the rain forest of southern Panama were overcome, to reach the northern Andes. The forking of the Andes provided routes eastward along the northern margin of South America. Southward the Andean highlands led to the penetration of the continent. Bolivia was a point of divergence, for from it the plains of Argentina and the highlands of southern Brazil could be reached readily by a primitive people.

Again it must be emphasized that the first peopling of the Americas was no mass migration moving swiftly to a known destination. While man arrived in South America early enough to witness the extinction of a number of large mammals, the time necessary for the thorough penetration of the two continents was a matter of thousands of years.

There is small degree of unity among the American Indians in a biologic sense. Rather they are compounded from a number of ancient and modern stocks. It seems probable that few if any of the early migrants to America were Mongoloids. Instead there are suggestions of primitive Caucasoid, Australoid, and even Negroid strains. Only in comparatively late times there came a flood of Asiatic peoples who gave to most American Indians the straight coarse hair, prominent cheek bones, and dark skin typical of Mongoloid racial stock.

The variety of Indian languages is as great as is found anywhere else in the world. The situation was frequently such that two adjacent tribes spoke languages as different as English and Chinese. Aside from Eskimo, which is represented by a



Indian migration routes (after Sauer)

few hundred speakers in northeastern Siberia, there is no known relationship between any American Indian language and any Old World tongue. Such evidence suggests both a respectable antiquity for the American Indian and a long period during which there was no important immigration from the Old World.

The cultural equipment of the first migrants, as mentioned previously, was exceedingly primitive. There were no domesticated animals, possibly not even the dog. Weapons may have been limited to spears or hand-thrown darts. Shelter was a matter of the simplest huts. Tailored skin clothing lay far in the future. Boats were crude affairs. Indeed, mere existence depended largely upon the providence of nature.

Later migrations and Asiatic contacts brought additional equipment. The dog, spear thrower, and bow were items on a growing list of new traits. The technique of grinding stone made possible new implements, including the adze and polished stone axe. New tools and techniques were followed by improved shelter and boats, more and greater variety of food. The common distribution in northern North America and northern Eurasia of such elements as the dog sledge, snowshoe, tailored skin clothing, and tipi indicates that the spread of culture traits continued into comparatively recent times. But even though the list of imported items be a long one, added together they are the equipment of a primitive people. The extent to which the American Indians advanced over a simple way of life they owe to their own initiative and inventive genius.

The Valley of Mexico and the highlands of Peru were the centers of the most advanced Indians at the time of Columbus' discovery. Both had highly organized social and political systems supported by a well-developed sedentary agriculture. Particularly in Peru, among the Inca, the degree of material advancement was high. Maize, Irish potatoes, and quinoa, a kind of grain, were the principal highland crops. Irrigation and terracing were highly developed. The soil was regularly fertilized. High grassy areas too cool for agriculture were employed for the grazing of llamas and *alpocas*, domesticated animals that provided meat, wool, and transport. The various parts of the Inca empire were connected by a series of excellent roads. There were buildings constructed of huge dressed stones. Metallurgy had advanced to the making of bronze. Woolen and cotton cloths were woven with a fineness of detail hardly matched elsewhere in the world.

In other parts of South America the drop in

cultural attainment was rapid. Except for metallurgy, the Chibcha Indians of Colombia but faintly approached the material accomplishments of the Inca area, but they did practice a sedentary agriculture. In the Amazon basin a shifting agriculture shared importance with hunting and fishing as a means of providing a livelihood. Land laboriously cleared produced crops for two or three years and then was abandoned in favor of new clearings because of decreased soil fertility and an increase of pests. The chief crop was manioc or cassava. Largely similar to the Amazon region in economic development were the West Indian islands. Manioc and other Amazonian crops were the basis of agriculture. In the skilled and extensive use of boats, the West Indian tribes possessed the nearest approach to a maritime culture in aboriginal America, south of the Polar World.

In the Argentine grasslands agriculture was subordinate to hunting and gathering. The guanaco and reha were major sources of food. The pampa Indians took readily to the horse when it was introduced by Europeans. Like their North American counterparts of the Great Plains they became thoroughgoing horsemen, migratory hunters, and fierce fighters against the European invaders.

The North American culture focus, the Valley of Mexico, was another center of intensive agriculture that extended intermittently northward to the Pueblo tribes of Arizona and New Mexico, and southward through the highlands of Central America. Maize, peppers, beans, and cacao were common crops in at least some part of the larger area. There were no domesticated animals comparable in importance with the llama and alpaca of South America. Despite the magnificent pyramids and temples built of stone, the range of material development seems somewhat inferior to that of the Inca area. On the other hand, surpassing non-material accomplishments were an excellent calendric system and writing, both most highly evolved by the older Maya of Yucatan and Guatemala.

The Pueblo tribes are the northern outlier of the aboriginal cultures whose major economic activity was an intensive agriculture. With their substantial stone villages and floodwater farming they represent a marked advancement over other Anglo-American Indians. However, a significant agriculture accompanying hunting, gathering, and fishing extended east of the 100th meridian to the Atlantic seaboard and north roughly to the line of the Great Lakes-St. Lawrence River. Maize, the principal crop, had reached its approximate climatic limit in this sector of North America.

The bison area centered on the Great Plains from the Rio Grande to the Saskatchewan. Here

increased emphasis on hunting may have eliminated a crude agriculture, to reach a climax of nomadic development after the introduction of the horse by Europeans.

West of the Pueblos, embracing most of the present states of Nevada and California, as well as adjacent territory, was the wild-seed area. As the name indicates, gathering was the major economic activity. Hunting, and to a lesser extent, fishing, were supplementary.

The salmon area occupied a coastal belt from northern California through southeastern Alaska. The wealth of sea life made possible a near-sedentary existence, with large, well-built wooden houses, and encouraged an extensive and skilled use of dugout boats.

The last of the Indian economic regions, the caribou area, agrees in distribution largely with the subarctic climate and forest. Although this area commonly includes the Eskimo of the Polar World, there is marked distinction between tundra-inhabiting Eskimo and forest-dwelling Indian. The latter were hunters of land mammals, fishermen, and gatherers. They made extensive use of birch-bark for canoes, containers, and shelter. Snowshoes and toboggans were used to traverse deep winter snows.

INDIAN CONTRIBUTIONS

The American Indians are well worth while as an independent field of study. Their significance in this geographical work is measured primarily by the extent to which they have contributed to the present-day American scene. It is important to know the relative proportions of Indian blood in the populations of today. It is more important to know how much and where Indian ways of living, pure or mixed in form, have persisted to the present.

In some cases Indian populations and cultures survive despite long contact with Europeans. In other cases they have been preserved by remoteness or because they occupy lands unattractive to the white man.

Numerous illustrations of the first case may be found in Latin America. Pure Indian populations occupy parts of highland Mexico, northern highland Central America, and the middle Andes. There is a limited absorption of European ways, but these Indians live essentially as their pre-Columbian ancestors did. They are sedentary subsistence farmers whose common crop is maize. Cultivation is intensive enough to support population densities of over a hundred per square mile in a number of spots in the Andes and Central America.

Examples of Indian peoples and cultures saved by remoteness or unattractive habitat are to be found in both North and South America. Such is the case for large areas in the Guiana Highlands of Venezuela and the remoter sections of Amazonia. In both instances, however, the density of population is low and no effective resistance could be offered to invasion by Europeans. Something of the same situation is encountered in subarctic North America. Here the expansion of mining promises the usual destruction of native peoples and ways.

Total area of the Americas considered, the Indians caused little alteration of the landscape as nature made it. A simple subsistence existence demanded no extensive cutting of forests. Mineral wealth was left largely untouched. There was little destruction of the land through soil depletion or erosion. There were few monuments such as a commercial civilization erects: great cities or a network of conspicuous transportation lines. Even the Europe of 1492 had little in common with the America of the same date.

Even so, a full inventory of the items borrowed from the Indians and incorporated into a culture originally European is truly imposing. Place names of Indian origin are numerous and familiar. Most non-Indian Americans recognize the borrowing of the canoe, snowshoe, and maple sugar. But these and numerous other culture traits are insignificant as compared with the list of cultivated plants taken from the Indians. Most of these plants are now so thoroughly a part of modern economy that their domestication by Indian horticulturists is forgotten. Among the more familiar and important are maize or corn, Irish and sweet potatoes, tomatoes, tobacco, cacao or chocolate, long-staple cotton, pineapples, the red peppers, the most common beans, and squashes. To these should be added rubber, coca or cocaine, and quinine, all of which were used by the Indians before Columbus. The modern planting of maize in hills, and the preparation of dishes such as hominy, grits, and succotash, are related borrowings.

The fact that these significant and now-widespread plants were restricted to America prior to the arrival of Europeans argues for their discovery and improvement by the Indians without outside assistance. As such they are a tribute to the Indians' practical genius.

Thus in 1492 the American continents awaited the coming of Europeans, their natural wealth virtually undisturbed. The aboriginal inhabitants, the Indians, were destined to fall before a technically superior people, but even so they contributed

materially to the cultures that were to succeed their own.

BEGINNINGS OF EUROPEAN SETTLEMENT

When Columbus landed on the island of San Salvador in 1492 he initiated a movement of Europeans to the new continents that has continued to the present time. Therein lies the legitimacy of the claim that Columbus discovered America, for although other Europeans had preceded him by some 500 years, their discoveries went for naught.

As early as the beginning of the sixteenth century it was generally realized that the route west from Europe led to new lands and not to the Indies that had been the objective of the first trip. The attempt to reach the East by going west continued, but more and more the new land was examined for its own sake. Explorers, adventurers, and fortune seekers from many lands followed Columbus' lead. The seafaring nations of western Europe: Spain, Portugal, France, Holland, and England, were aware of the new opportunities in this period of awakening commercialism. The net results were an expanding picture of the new lands, and the establishment of claims of ownership, often conflicting, on the part of the European powers.

Columbus' fourth voyage in 1502-04 was spent largely in seeking a water passage westward through Central America. Cabral on his voyage to the Indies in 1500 is purported to have sighted the coast of Brazil, thus giving Portugal a claim to that area. In 1513 Balboa crossed the Isthmus of Panama and christened the South Sea in the name of Spain. Magellan, a Portuguese in the service of Spain, wintered on the Brazilian coast in 1519 and in the following summer discovered the strait bearing his name. Also in 1519, Cortez set out from already-occupied Cuba to conquer Mexico. In 1533 Pizarro completed the conquest of Peru. By the middle of the sixteenth century the Spaniards were established in western South America, from Venezuela to Chile. The Amazon had been followed from Peru to its mouth. The Parana route from Peru to the La Plata estuary was opened. By the end of the sixteenth century the major configuration of all Latin America was known. The coast line from the Gulf of California to Tierra del Fuego and on to the West Indies was outlined. The great river systems were recognized. In Mexico, Central and South America regularly used routes crossed from ocean to ocean. The energetic Spaniards were far ahead of developments in Anglo-America.

It was Spaniards who first determined the gross

configuration of what is now southern Anglo-America. DeSoto and Coronado were the great figures of a group of explorers who by the middle of the sixteenth century had illuminated the geographical picture over a vast territory extending from the Atlantic to the Pacific. The coasts of Florida and the Gulf of Mexico were fairly well established. De Soto's party had penetrated inland to the Carolinas and traversed the Mississippi from the junction with the Arkansas River to the mouth. Coronado in his search for Quivira reached what is now southwestern Kansas. The Pacific coast had been followed to northern California.

Meanwhile the English and French had been active along the north Atlantic coast. In a series of voyages made around 1500 the Cabots, sailing for England, cruised the coast from Hatteras to Hudson Strait. Just before the middle of the sixteenth century Cartier ascended the St. Lawrence to the site of Montreal, thus establishing the French claim to that excellent route of ingress into the interior of the continent. Considerable detail was added to this picture by around 1600. Hudson had sailed up the Hudson River and he had discovered Hudson and James bays. Champlain had travelled up the Richelieu River to Lake Champlain and had established the Ottawa-Mattawa canoe route to the upper Great Lakes. He knew that the latter were "sweetwater," and hence not part of the western sea.

At the beginning of the seventeenth century the exploration of the interior of Anglo-America was in its earliest infancy, but nevertheless a new epoch was ushered in by the establishment of settlements by both English and French on the Atlantic seaboard. Here again the Spaniards were far ahead, with their first settlements already a century old.

EARLY SPANISH SETTLEMENTS

The first Spanish settlement was on the island of Hispaniola. From this nucleus other settlements were founded in Cuba and other islands of the West Indies. Although Hispaniola soon lost its place of importance in the new Spanish empire, it set the pattern for development elsewhere. The finding of placer gold initiated a frantic search in which Spanish supervisors unsparingly drove native Indian slaves.

Spaniards were not seeking new homes for landless peasants, nor were they providing sanctuary for the persecuted. They sought to fill the coffers of a depleted Spanish treasury and they strove individually to gain wealth whereby they might return to Spain with financial security and assured

social position. Incidentally they desired to see the Indians converted to Christianity. Such attitudes conditioned the Spaniards' opinions regarding the relative desirability of various sections of the new lands. An abundance of precious metals was the first criterion. If these metals were already mined, so much the better. A dense, docile Indian population would produce food for the conquerors, and provide labor for the extension of mining, and converts to the Christian faith.

These conditions were met perfectly in two areas: the Valley of Mexico and Peru. In both places a handful of technically superior Spaniards defeated the native rulers after sharp conflicts. The well-disciplined Indian populations readily accepted new masters; they became at least nominal Christians; to some extent they took over European crops and domesticated animals. The horse, sheep, cattle, and wheat found some place in the new scheme of life. The base of economic existence, however, remained much the same for the great mass of Indians, a sedentary subsistence agriculture with corn or maize the common crop. Changes of different nature were effected by a drainage of males to work the mines and the introduction of new epidemic diseases. To the present day the Indian population of highland Peru does not reach the figure estimated for the date of Pizarro's conquest.

Mexico and Peru provided the two great centers of colonial times. Mexico City was built on the site of Montezuma's capital. Pizarro chose a coastal location, Lima, rather than Cuzco, the old Inca capital in highland Peru. Mexico City and Lima were the urban type for Spanish America: a square or plaza containing the cathedral and administration buildings; and about it a rectangular pattern of streets. The dense Indian populations and min-

eral wealth that gave rise to the two cities were the model whose possible duplication drove Spanish adventurers on their far-reaching explorations.

Virtually every important early settlement had at least one of two qualifications of location: it was situated in or *en route* to a mineral-producing area; or it lay in a region of dense native population. Prominence in political administration followed economic importance. Legal decree certified the place of individual settlements in the economic and administrative pattern. Lima was the great center to the south; Callao was its port. Old Panama was the Pacific terminus of the land route across the isthmus. Cartagena was on the route to Bogota, administrative center for the northern Andes. At the same time Cartagena was a fortress to protect the plate fleet en route from Panama. Distant Habana guarded the course of the fleet through the Strait of Florida. Antigua and subsequently adjacent Guatemala City were founded among a dense Indian population. First the former then the latter became administrative



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center for the region extending to Panama. Acapulco was Mexico's Pacific port, and as such was the base of the galleon fleet sailing to and from the Philippines. Veracruz was Mexico's official Atlantic port. Even interior Asuncion on the Parana was a station on the "backdoor" route to Peru from the La Plata estuary; one reason for selecting the specific site was that it lay among a dense, peaceful, sedentary native population.

However excellent their endowment in other respects, many areas lacking both minerals and dense native populations remained long undeveloped. A case in point is the humid-pampa area adjacent to the La Plata estuary. The Argentine grasslands, lacking minerals and inhabited by a sparse population of fierce nomads, were little esteemed by the Spaniards, who relegated them to the lowly function of supplying cattle and mules for Peru. Buenos Aires, now the great city of an immensely productive region, was not permanently established until 1580, and its emergence as a major urban center has come since the middle of the nineteenth century.

Lacking mineral wealth, areas having dense native agricultural populations could still be sources of wealth and prestige to impecunious Spaniards. This was through the granting of large estates, and the establishment of a feudal system whereby Indian tenants served Spanish lords. Direct taxation was one source of income; another was the production of commercial crops. The pattern of the large estate was widely extended over Latin America, while the production of a specialized commercial crop reached even broader limits.

There were well-situated areas of obvious agricultural possibilities that lacked the initial attractions of mineral wealth and abundant supply of native labor. Nothing could be done about the deficiency of minerals, but the problem of labor was solved by the importation of Negro slaves, or, in a few instances, by the Spaniards themselves becoming peasant farmers. The institution of Negro slavery spread throughout the islands of the West Indies and extended to the low tropical lands bordering the Caribbean and the northern Atlantic coast of South America. Examples of pure European stocks becoming small peasant farmers during early colonial times are rare. One such is found in the highlands of Costa Rica, where in the latter part of the sixteenth century a group of Spanish families adopted subsistence farming as their way of life. About a hundred years later another group, located in the Antioquia region of Colombia, made the same decision. Though both regions are now largely producers of a commercial

crop, coffee, they still exhibit a pattern of small farms, and are notable for their vigorous agricultural expansion. In the several respects that distinguish them, both areas stand in striking contrast to the system of large estates and hired labor still so common in Latin America.

EARLY PORTUGUESE SETTLEMENTS

In 1494 the Treaty of Tordesillas between Portugal and Spain assigned to the former all territories lying east of about the present meridian of 50° W. This meant that the eastern bulge of South America was acknowledged to be a Portuguese possession. Preliminary exploration revealed no great amount of gold and silver and showed the Indian population to be sparse and poorly adapted to steady labor in mine or field. The net result was a casual interest in the new land, especially since Portugal had profitable holdings in India and the East Indies. Only with Spanish and French encroachment on Portugal's American claim was there a vigorous fostering of settlements in Brazil to counteract the aggression.

The coast was divided into a number of districts, each independently administered by its appointed leader. Many of the early settlements failed; others hung on to become nuclear centers in Brazil's growth. Among the significant survivors of the difficult beginnings were São Salvador, founded in 1502; Recife, 1561; and highland São Paulo in 1554.

It was the northeastern coastal section, including the settlements of São Salvador and Recife, that exhibited the first energetic development. Dyewood was the first commercial export. Agriculture for export got underway with the raising of tobacco, to be followed shortly by sugar cane, an introduced crop with which the Portuguese were familiar. So favorable were the natural conditions and so excellent the returns from sugar, that in 1538 Negro slaves were brought to São Salvador to supply the demand for labor. Although the bonanza period of Brazil's sugar production came in the late sixteenth and seventeenth centuries, the pattern of development was established early. Large estates operated by slaves supported a proud aristocracy. Little if any better off than the slaves were numbers of poor whites. Some of the latter went inland, there to develop a pastoral and small-agricultural economy, strikingly different from the coastal system.

The history of early settlement in Latin America is significant in one respect because it gives insight into the origin of economic patterns and attitudes prevalent to the present. An extreme but common attitude is the hope of obtaining wealth and posi-

tion, whether they come from minerals or from large-scale mining of land in the form of crops of sugar cane, coffee, or wheat. Even the mestizo or mulatto, struggling to live, is not free from grandiose aspirations. All too rare is concern for wise use of forest, mineral, or land.

Diametrically opposed in theory and practice are the remnant sedentary Indians. They hold their individual tracts by community consent. Their crops are not for sale. They see no advantage in the ownership of vast tracts of land, nor desire a place in the world of commerce.

EARLY ANGLO-AMERICAN SETTLEMENTS

The first permanent settlements in what is now Anglo-America were established by Spaniards. Although De Soto, Coronado, and other explorers gave discouraging reports regarding mineral wealth, the Spaniards founded and maintained a series of northern outposts of their vast empire. The northern Spanish settlements may be thought of as four crooked fingers extending far from the nucleus in the Valley of Mexico. One was Florida; a second, Texas; the third reached up the Rio Grande in New Mexico; and the fourth to a point a few miles north of San Francisco Bay in California.

St. Augustine, Florida, was established in 1565; Pensacola in the same state was intermittently occupied after 1559. The Florida settlements were directed mainly against the encroachments of the French and British.

Next in order of establishment was a series of missions marking the route northward from Mexico through El Paso del Norte and up the Rio Grande. San Juan, the oldest, was founded in 1598; Santa Fe in 1609. A major purpose of the missions was to convert to Christianity the advanced Pueblo Indians, an effort in part doomed to failure.

The Spaniards did not plant permanent settlements in Texas until the French were attempting to occupy

the lower Mississippi Valley. Between 1690 and 1731 twelve missions were established at strategic points, less to convert the scanty Indian population than to prevent aggressive moves by the French.

The motive for settlement in California was parallel to that for Texas. It was not until Vitus Bering in 1734 initiated Russian interest in the north Pacific coast that the Spaniards felt the need to occupy Alta California. During the latter third of the eighteenth century they established a chain of missions reaching through coastal California from San Diego to San Francisco Bay.

The Spanish extensions into Anglo-America were but lightly held. They led to no marked concentrations of Europeans, to no intensive utilization of the land. Their very existence depended upon the maintenance of long routes to the south. There were no established east-west connections between them. They fell an easy conquest to the inevitable western expansion of Anglo-Americans. Still, they contributed in no small measure to the culture of their conquerors. Place names, terms, the details of the range cattle industry, architecture, and the citrus fruit and vine of California became integral parts of the varied Anglo-American way of life.

Meanwhile the French and English were active in the northerly portions of the Atlantic coast considered to be of little or no value by the treasure-seeking Spaniards. After a number of failures over a period of years, the opening of the seventeenth century witnessed the founding of



Anglo-America: colonial settlements

three nuclear settlements, the French on the St. Lawrence, and the English in Virginia and New England. Each was destined to develop along special lines; together they dominated the settlement character of Anglo-America.

Since the time of Cartier the French had maintained summer fur posts along the lower St. Lawrence. Fishing vessels from France and other European nations gathered annually on the banks off Newfoundland. However, it fell to Champlain to establish the first French settlements, Port Royal, now Annapolis, Nova Scotia, was founded in 1604 and was occupied continuously with the exception of a three-year period between 1607 and 1610. The site on the eastern shore of the Bay of Fundy was well chosen from the standpoint of agricultural development, but it was decidedly offside with respect to the St. Lawrence and the major French interest, beaver. The real founding of French Canada came with the establishment of Quebec in 1608.

From their base in Quebec the French ever sought out new sources of fur. Barred on the south by the enmity of the Iroquois, they used the Ottawa River route to the upper Great Lakes. Crossing the divide to the Hudson Bay slope, they came in contact with the English Hudson's Bay Co. after 1670. The waterways west to the Mississippi and south to the Ohio became the domain of French fur traders even before formal exploration "discovered" them. So ardent was the search for fur that agriculture got a late start in the St. Lawrence Valley. Its real beginnings came about 1700 with the arrival of peasants sent from France especially for the purpose.

A few Frenchmen could see something beyond a personal fortune from furs. LaSalle was one of them. After he had explored the Ohio and followed the Mississippi to its mouth, he envisioned a New France occupying the whole Mississippi drainage basin. He sensed the necessity of a strong settlement to hold the mouth of the Mississippi. LaSalle met his death in the unsuccessful attempt to found such a settlement, but his successors, Iberville and Bienville, brought his dream to reality in the early years of the eighteenth century by establishing French control at a number of points along the Gulf Coast.

To hold their vast American empire the French had posts, forts, or settlements at strategic points on the Great Lakes, along the Mississippi, the Ohio, and on connecting streams such as the Illinois and Wabash. Scant though their numbers were, Frenchmen pushed on west of the Mississippi. By 1750 a party of *voyageurs* had reached

Santa Fe by going up the Canadian River, and the La Verendrye brothers had seen the Black Hills.

The year 1763 marked the end of French empire in America. Defeated in the Seven Years' War, the French surrendered to the British all territories lying east of the Mississippi. To Spain France ceded Louisiana west of the Mississippi. The last-mentioned territory was again French between 1800 and 1803, but this temporary hold was ended by the sale to the United States of the Louisiana Purchase.

Although France lost its political hold on America nearly two hundred years ago, French influences and French ways are persistent to this day. Quebec, if not to be matched in modern France, is decidedly exotic in an Anglo-American world. To a lesser extent the same is true of parts of Louisiana. In such varied aspects as speech, religion, and cookery these regions differ from those about them. French place names, often highly distorted by the English-speaking, unevenly sprinkle the continent. The elongated strips of the old French land divisions persist in spots as widely separated as Nova Scotia and the Arkansas Valley.

Very different in nature from the extended French settlements were the compact agricultural English colonies in Virginia and New England. But even the latter, because of site differences and perhaps because of inherently different attitudes, developed along diverging paths.

The first permanent English settlement was founded at Jamestown in 1607. The first few years were spent in trying to survive the perils of inadequate food, disease, and unfriendly Indians, and in a futile search for gold. The introduction of tobacco as a commercial crop in 1612 sounded the keynote of future development. The humus accumulation on newly cleared forest lands proved to be highly productive. If the land had to be abandoned after a few years, there was plenty more to be cleared.

The demand for labor to produce the tobacco crops caused the introduction of Negroes as early as 1619. The first Negroes were indentured servants, but the institution of slavery was found to be profitable economically and became acceptable morally. During the seventeenth century the economic and social lines were being drawn. At the top was a small class of wealthy planters living on large plantations worked by indentured servants and black slaves. There was a large yeoman middle class operating small farms largely with their own labor. At the bottom of the socioeconomic pyramid were the indentured servants and slaves. The former could hope in time to become middle-class farmers.

The eighteenth century witnessed an expansion

peddlers were familiar figures in colonies outside New England. They sold a variety of articles at first manufactured by hand and then increasingly utilizing the power of New England streams.

The wealth so evident in the fine houses in the seaport towns of colonial New England was not the product of New England soil. The land was largely only the base of operations of New England carriers and traders. The system worked such that the wealth of the great families did not deny a place to a substantial middle class nor did it degrade through slavery the position of the small farmer.

Such were the two most significant nuclear set-

lements in colonial British America. Space does not permit an elaboration of their influence in the westward expansion of a new nation. In general the traditions of Virginia were dominant in the South; those of New England, north of the Ohio River. Further western movement brought strong dilution of the ways of the Atlantic seaboard. The grasslands demanded special cultural adaptations. The effects of Spanish America were felt northward across the Great Plains. Mining, range grazing, irrigation agriculture, dry farming, and Mediterranean crops had few if any direct antecedents in early New England and Virginia. The varied cultural landscape of Anglo-America is the product of many factors. Some of them are suggested in the regional descriptions to follow.

53: Northern Anglo-America

Anglo-America as here delimited consists of the United States, Alaska, and Canada (including Newfoundland) exclusive of the areas considered part of the Polar World. However, the regional divisions of Anglo-America are drawn with no regard for political boundaries. Political boundaries are not in themselves always of prime geographical importance. They are convenient for regional delimitation where they lie in a kind of no-man's land between concentrations of population. Such is not commonly the case in Anglo-America.

An examination of the population density map of North America reveals the extent to which this one item disregards political boundaries. Maritime Canada has the same average densities as does adjacent New England. Southern Ontario falls in the same category as do adjoining New York and Michigan. Southern Manitoba is like neighboring Minnesota. While similarity in population density is not necessarily indicative of uniformity in other cultural respects, in the examples cited there is agreement. Maritime Canada, for example, certainly has more in common with northern New England than it does with the prairie provinces.

In the following sections devoted to the regional description of Anglo-America it will be noted that some regional names refer to natural conditions: plant cover, climate, or relief. Others are locational. One refers to the dominant crop. Such inconsistencies of nomenclature should not imply uncertainty as to the basis of regional distinction, for the fundamental criterion is man and the imprint on the land indicative of his manner of living.

THE NORTHERN FOREST

The Northern Forest is a vast region extending from Newfoundland to the Rocky Mountains. Its northern boundary is the tundra. To the south it reaches the Canadian prairies, Lake Winnipeg, the northern Great Lakes, and the Laurentian Mountains of Quebec.

It is a land of little relief, bare-rock surfaces, countless lakes, and clear, rapid, patternless streams, all the products of continental glaciation. Its surface is mantled with swamps, muskegs, and a largely coniferous forest. The climate is continental, with bitterly cold, long, snowy winters and a short summer growing season.

Culturally the Northern Forest is distinguished by a sparse population whose major economic interests are furs, mining, and timber. The permanent success of agriculture in any extensive part of it is still questionable. There are no truly large cities. Railroad and highway mileage is very low.

The exploitation of furs, timber, and minerals, while not strictly exclusive as to time or place, may be thought of as successive waves originating at the south and sweeping northward. Furs came first and for long made the region the most productive in Anglo-America.

The Indians of pre-white days were hunters and fishermen who wintered in small groups on the family hunting grounds and met in summer ren-



United States and borderlands:
population density

devous to transact tribal affairs. The system was little disturbed by the coming of European fur traders. The latter established posts at points convenient for the summer gatherings. The Indians accepted the traders' goods and in return brought in furs, at first primarily beaver. Canoe brigades from Montreal or ports on Hudson Bay brought goods to outlying posts and carried back cargoes of fur.

Even in colonial times the expansion of fur posts extended well into Mackenzie drainage and to the very borders of the treeless tundra. Heavy trapping in the more accessible regions brought a decline in beaver. The advance of civilization in the form of mining and lumbering during the last hundred years has led to the abandonment of posts at the south and the moving north of the center of fur production. The retreat northward is still in evidence.

The commercial logging of white pine began in Maine. It reached the Northern Forest in Quebec, Ontario, and the upper lake states, getting well underway during the last third of the nineteenth century. Less than a half century sufficed to finish the job in the United States. The last stands are now being logged in western Ontario. The cutting of other species for lumber or pulpwood continues a major industry, but it too moves gradually northward.

The copper deposits of Keweenaw Peninsula

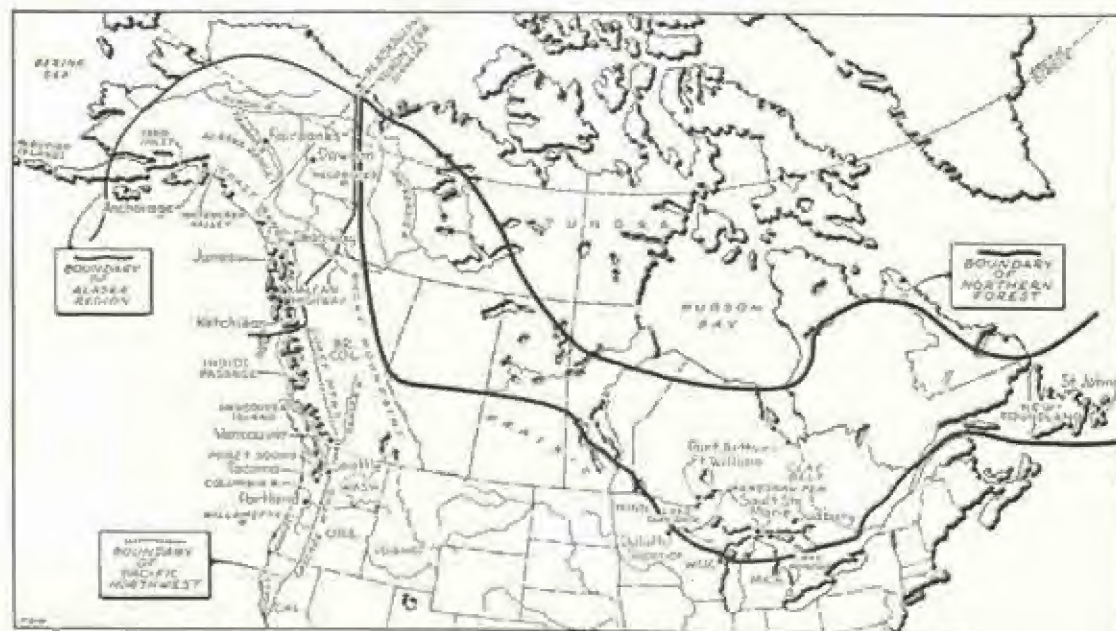
were the basis of the first big mining boom. Large-scale operations began in the 1840's; by the 1850's they were important enough to cause the opening of a ship canal around the rapids at Sault Ste. Marie. The demand for copper grew apace with increased use of electrical power. Less than a hundred years brought the practical exhaustion of the Keweenaw deposits.

Mining of iron ore began in Michigan almost simultaneously with copper. It spread westward into Wisconsin, and in the 80's reached Minnesota. For many years these three states have produced a major part of the world's iron ore. The end of the best-grade ores is in sight, but others less rich are extensive.

The major Canadian mining district is situated north of Lake Huron and east of Lake Superior. This section is the world's leading producer of nickel, and in addition, iron, gold, silver, platinum, and other ores are mined. Newfoundland, an exporter of iron ore, has a decided advantage in the proximity of the mines to tidewater.

Although the southern margin of the Northern Forest is by no means depleted of its minerals, the expansion of mining northward has reached to the tundra in the last few years. Improvement of transportation, notably the airplane, has accelerated prospecting and made mining practicable, especially for the precious metals and uranium ores.

The expansion of what should logically be the fourth form of utilization, agriculture, has been



Northern forest; Alaska; Pacific Northwest; index map

slow and uncertain. Following lumbering optimistic settlers cleared the cheap land with little regard for its particular potentialities. Few such ventures have been successful as compared with commercial agriculture farther south. Climate, soils, and distant markets preclude the general development of anything more than subsistence farming. With the possible exception of the French Canadians of the Ontario-Quebec clay belt, few Americans are satisfied with such an existence.

Industrialization and accompanying urbanization have made but slight imprint upon the scene. Towns built by lumbering are ephemeral, and to lesser degree the same is true of mining towns. Industry of permanent nature has found no advantage to location within the region. The timber and minerals produced in the Northern Forest are largely manufactured or used outside its boundaries. The function of most urban centers is to produce or handle raw materials. Following is brief mention of the location and function of the chief cities, all in the southern border.

Duluth-Superior (160,000) are contiguous cities at the western tip of Lake Superior, where rail and water transport meet. Their chief function is the handling of bulk cargoes: iron ore and wheat from rail to ship, and coal from ship to rail.

Port Arthur-Fort William (55,000) are the Canadian head of Lake Superior. Their principal function is the transfer of western Canadian wheat from rail to ship.

Sudbury (32,000) is the largest urban center in the Ontario mining district. It specializes in the mining and smelting of ores.

St. Johns (45,000) is a headland port in Newfoundland. It is a base for fishing and sealing off Labrador.

ALASKA

The term Alaska as here used to designate a region of Anglo-America has somewhat different extent than the political Territory of Alaska. It excludes the tundra margins to north and west, and it leaves with them in the Polar World the treeless Aleutian Islands. It includes the drainage basin of the Yukon system lying in Canada. The justification for a region so delimited is cultural. It rests upon a common history of exploitation of natural resources, fisheries, minerals, and furs.

Natural Alaska falls into two very different parts, coast and interior. Coastal Alaska has a *marine* climate, that is, winters are mild and summers cool. Precipitation is heavy and there is no marked dry season. A heavy forest stand is composed of conifers, mainly spruce and hemlock. Fiords, islands, and sharp peaks leave little level

land and reflect the dominance of ice as a sculpturing agency. Present-day accumulations of glacial ice are extensive; in a number of places they reach down from the mountains to tidewater. The geologic history of the rocks is sufficiently varied to yield minerals ranging from copper, gold, silver, and lead, to coal and petroleum. The coastal streams and near-shore waters are one of the world's best fishing grounds, providing salmon, halibut, herring, and other excellent food fish.

Interior Alaska lies beyond the inner ranges of mountains; the Coast Ranges at the south and east; and the Alaska Range at the north and west. It is essentially the plateau drained by the Yukon River. In contrast to the coast the climate is *continental*, with long severe winters, and summers having at least occasional spells that are hot. Precipitation is greatly reduced. The plateau surface has an average elevation of about 3,000 feet; it is highest at the east and slopes westward to disappear beneath the tundra plain bordering Bering Sea. The stream valleys are cut deeply below the generally accordant tops of divides. Evidences of direct glacial action are lacking. Woodland patches composed of spruce, birch, and willow dot the valleys, but the interstream ridges rise above the cold timber line. Important mineralization includes placer gold and coal.

The first European interest in Alaska was the result of Bering's explorations near the middle of the eighteenth century. He reported an abundance of an excellent fur, sea otter. Russian posts were established in the Aleutians and on the coast as far south as Fort Ross, California. China provided an accessible and ready market for furs. The Russians did not penetrate interior Alaska, nor did they come in sufficient numbers to establish permanent and substantial coastal settlements. Unable to utilize the fisheries and unaware of the value of its mineral wealth, Russia disposed of Alaska by sale to the United States in 1867 for the nominal price of \$7,200,000.

American interest in Alaska was retarded by scepticism regarding the value of Seward's "ice box." Seasonal salmon fisheries and unimportant placer-gold mining brought a few Europeans to the coast. The interior produced furs, and during the 1880's and early 1890's enough placer gold to tempt prospectors to further search. The rush of 1898 followed the discovery of rich gold deposits on the Klondike, a small stream tributary to the Canadian Yukon. Thousands of hopeful gold seekers poured into the region to build Dawson into a city of 30,000 within a matter of months. Prospectors pushed on to make other discoveries,

the most successful of which were in the vicinity of what became Fairbanks, American Alaska. The last big stampede came about 1915, and it now seems unlikely that any large, rich body of placer gold remains undiscovered.

Modern Alaska is still largely in the frontier stage of development. The exploitation of natural resources overshadows more permanent patterns of living. That sedentary agriculture will ever become widespread is still open to question.

This enormous land, about a fifth the size of the United States, as here construed has a population of about 129,000. Of this total about 109,000 are whites and 20,000, natives. The population of no town reaches 15,000. Total railroad mileage is around 600, and through highways add to a figure about three times as high.

The bulk of the population and major economic activities are concentrated in coastal Alaska. Here are the fisheries and steady, if undramatic, lode mining. Here is tremendous waterpower, and magnificent scenery to draw tourists. The cutting of the forests reaches the proportions of a major industry. And here, in the Matanuska Valley, is the most successful agriculture of the whole region. The Valley, however, is not to be regarded as typical of numerous possibilities. Few other areas have a similar combination of flat ground, warmer-than-average summers, and less-than-average rainfall. No others, it is to be hoped, will gain impetus to prosperity through government spending in connection with a world war. In summary, the future of the coast would seem to be outlined in terms of fisheries, minerals, timber, tourists, and perhaps manufacturing utilizing hydroelectric power; and not in terms of a basic sedentary agriculture.

The basis of economic existence in the interior is still mining. Today's mining is a matter of lean ground profitably worked for gold by large-capacity dredges, drag lines, and bulldozers. Such operations employ relatively few men and the profits go outside the country with the operators at the end of the short summer season. Agriculture utilizes perhaps 10,000 acres, mainly in the vicinity of Dawson and Fairbanks. Admitting that crops of grain, roots, and hay can be successfully grown, the absence of extensive markets points toward a subsistence rather than a commercial agriculture, a future not acceptable to those capable of farming in a hard country. Fur is a declining yield, due largely to lack of sound regulation. It is hard to see for the interior a future that departs from the present pattern or intensity of utilization.

While urbanization in the usual sense is lacking, the towns perform functions no less vital because they operate on a small scale. Following is a brief orientation for each of five principal population centers.

Ketchikan (5,300) is the first port of call on the "inside passage" from the south. It is a fishing center for both salmon and halibut, and the outlet for promising mining country.

Juneau (6,000) is the political capital, center of lode mining, and important for fisheries and timber operations. It lies on the steamship route to Skagway, the gateway to the upper Yukon.

Anchorage (11,300) is a port at the head of Cook Inlet, on the railroad leading to the interior. It is also the outlet of agricultural Matanuska Valley.

Fairbanks (6,000) is the crossroads of the interior, situated in the Tanana Valley. It is the terminus of the railway and highway to the coast, of a highway to the Yukon, and of the Alcan highway. It is also a center of air routes. About it is a mining area and the most-extensive interior agricultural district.

Dawson (1,000) is the declining center of the Klondike district, Canada. It is now mainly of historic interest, and is offside with respect to modern developments such as the Alcan highway and Canol project.

EASTERN MARITIME REGION

The Eastern Maritime Region includes the six New England states and three provinces of Canada: Nova Scotia, New Brunswick, and Prince Edward Island. The term maritime is locational rather than primarily indicative of climatic qualities or cultural developments; the climate of interior New England is continental, while Prince Edward Island, even though surrounded by the



Eastern Maritime Region: Index map

sea, has no history of notable maritime achievement.

The meagerness of the region's natural endowment has already been described in connection with the first settlement of New England by Europeans. The climate where not continental is raw and generally disagreeable. Areas of good arable land are few and scattered. Mineral wealth is limited to building stones, quarried in several places, and coal in Nova Scotia. Even position is that of a headland, with resulting disadvantages to ports in their connections with the interior. On the credit side are proximity to excellent fishing grounds, an abundance of good harbors, and a formerly excellent forest stand.

The previously described early economic development of New England was paralleled in maritime Canada. The limited success of agriculture was common to both. Nova Scotia became a base for fishing fleets, and in time a carrier of world commerce. The cutting of the forests of New Brunswick matched the exploitation of Maine's pineries. The exhaustion of forests and the decline of their merchant fleets marked significant breaks in both areas. Beyond this general parallelism there are differences. The decline of New England's merchant marine with the Civil War resulted in the acceleration of developments long underway, man-

ufacturing and accompanying urbanization. No such shift of economic endeavor occurred in maritime Canada, and, in fact, was of limited effect in northern New England.

New England manufacturing has always been notable for its diversification, perhaps because of the very paucity of natural resources. There were no deposits of iron and coal as the basis of a heavy industry. Most of the raw materials had to be imported. Even waterpower, used directly or converted into electricity, had to be supplemented by importations of coal to provide industrial power. The nature and variety of manufactures is attested by the familiar association of place and product: Lynn, shoes; Waltham, watches; Danbury, hats; and Bridgeport, hardware.

Intensification of industry has caused the southern three New England states to become the most densely populated in the United States. Since political boundaries can limit the official size, it happens that Boston (10th) is the only New England city among the first ten for the United States in 1950. Even so, there are areas, as between Boston and Providence or between New York and New Haven, where there is no apparent break in the urban pattern. Accompanying urbanization is c



Maine farmstead (U. S. D. A. photograph by Hutton)

preponderance among city dwellers of peoples of foreign birth or recent foreign extraction.

The rural population is still largely old-American stock, a situation that reflects the general unattractiveness of New England agriculture. Abandonment of sterile hill farms in favor of migration to cities or to better western lands has been going on for a long time. Aroostook potatoes, Cape Cod cranberries, New Hampshire dairying, and Connecticut Valley tobacco are but some of the bright spots in an otherwise dark picture. A more profitable utilization of the countryside is the entertainment of tourists, an endeavor yielding an income second only to that from manufacturing. The purchase of old farms as summer homes by city dwellers has virtually exhausted the supply in Connecticut and approaches that condition in Massachusetts.

The three Canadian maritime provinces present a picture broadly parallel to that of northern New England. Along the Nova Scotia coast fishing is the major activity. The land is dominantly forest covered, cut over at least once. Substantial agriculture is restricted to better lands: dairying on Prince Edward Island, and apple orchards in Nova Scotia, for example. Missing from the scene are the industrialization and urbanization characteristic of southern New England. The lone important representative of manufacturing is the iron and steel industry of Cape Breton Island, fostered by the local occurrence of coal and the ready availability of Newfoundland iron ore.

Boston, in urbanized southern New England, is the one great city prominent in the national scene. In a number of respects it epitomizes New England. The city population is 802,000, but it is the core of a metropolitan cluster of over 2.5 millions. The output of its industry is enormous, but no one product is dominant. Endowed with a magnificent harbor, Boston's headland position restricts the port hinterland to adjacent New England. Incoming ships carry bulky raw materials; outgoing ships, lighter manufactured goods. Local capital finances such exotic ventures as copper mining in distant lands. Cultural and educational institutions set standards for the nation. The average Bostonian is an American of recent foreign origin, but financial power rests with a minority of old New Englanders.

ST. LAWRENCE VALLEY

St. Lawrence Valley is here used as a regional term to designate the heart of French America. As a natural area the term means an elongated

depression varying in width from twenty to seventy miles lying between the harder and higher Laurentide Mountains to the north and the Adirondacks and uplands of the New England system to the south.

The region is the nucleus of a distinct people and of a distinct way of life. It is more than a museum of curiosities to be enjoyed by the touring Anglo-American. Its peoples and ways exert a positive influence, not only in Canada but also in the United States. From a total French immigration that numbered 60,000 to 70,000, some 4 million descendants constitute about a third of Canada's total population. French-Canadians are a large element in New England, and are well represented in the Lake States. They are pioneer settlers in the Clay Belt and on the northern frontier of the Canadian prairies. They are tenacious of their ways and their birth rate is exceeded among white people of all the world only by the Dutch Boers of South Africa.

Although preoccupation with the fur trade resulted in a late introduction of agriculture to French Canada, once established its roots went deep. Agriculture remains the economic base in the St. Lawrence Valley. It is a matter of small farms and the growing of oats, hay, and roots. Since 1900 dairying has become an increasing consumer of the crops, and dairy products the immediate source of cash income.

The rural landscape is distinctively French-American. Land divisions are narrow strips reaching back from the river. Dwellings front the road along the river bank. Small white villages are dominated by the church. Two-wheeled carts are still a common means of conveyance. Shrines lend an Old World atmosphere.

The small farms cannot be divided indefinitely among a numerous progeny. Migration, temporary or permanent, of those able to work is often a necessary procedure. Within the region or its sphere is small manufacturing of such articles as shoes and cloth. From Thetford Mines comes the bulk of the world's supply of asbestos. But timber and waterpower combine to provide most employment. Winter cutting of trees on the left-bank tributaries of the St. Lawrence is followed by spring drives on these streams to mills situated near their mouths. Falls provide the power to change the logs into pulp and paper. Surplus hydroelectric power has resulted in the erection of smelters to convert imported ores into alumina and aluminum to be manufactured elsewhere.

Two cities dominate the region. Quebec is the city of tradition, and in that respect the most interesting in Canada. Montreal is the commercial center of the whole country.

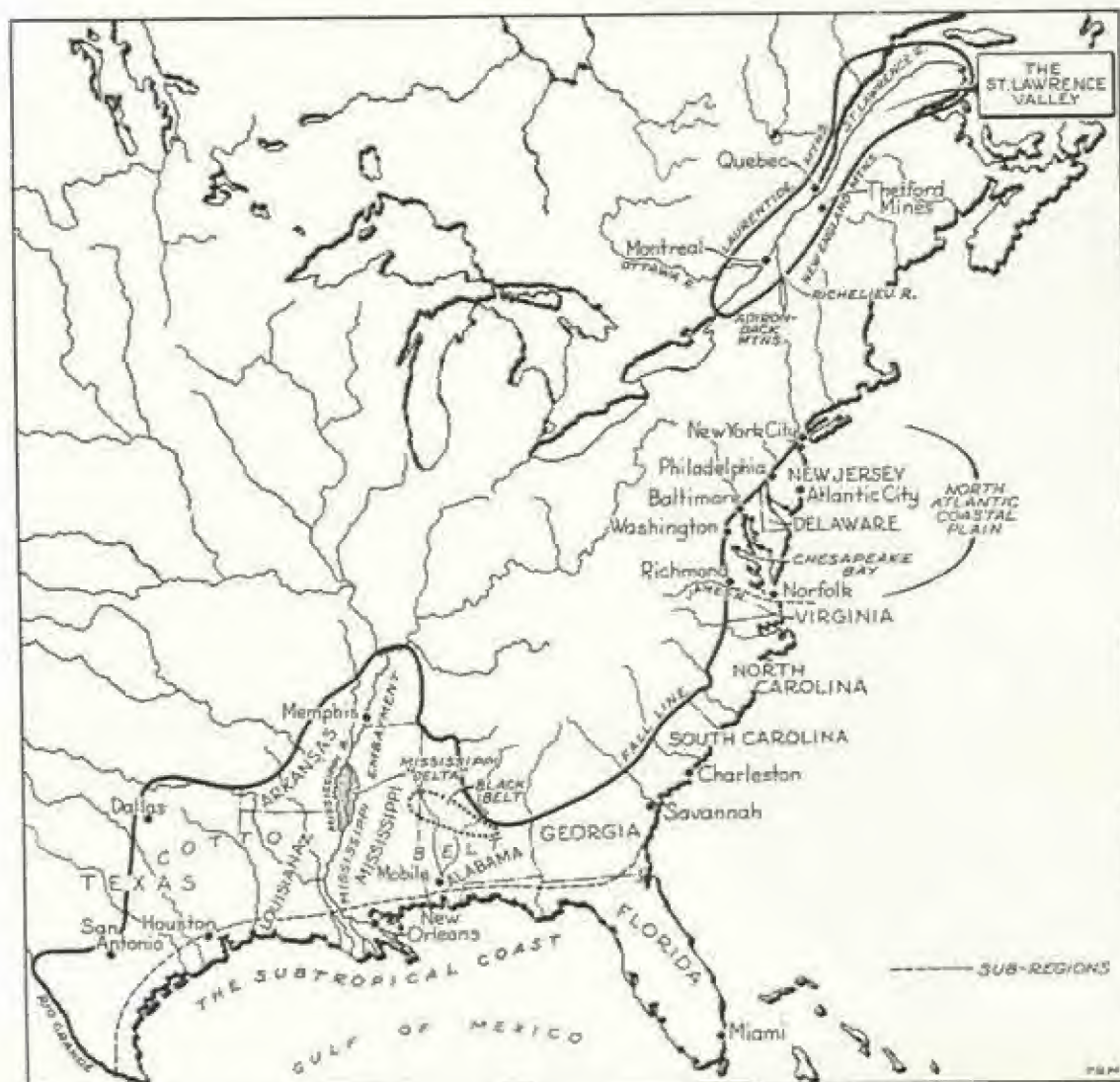
Quebec (275,000) is the old fortress site at the point where the St. Lawrence widens to the estuary. It is the only walled city in Anglo-America; with the wall go picturesque buildings and narrow, crooked streets. Quebec's commercial importance is restricted to its immediate hinterland.

Montreal (1.4 million) is situated at the natural head of deep-water navigation on the St. Lawrence. It is a crossroads of natural routes: up and down the St. Lawrence; up the Ottawa River to the north and west; south through the Richelieu-Champlain-Hudson depression to New York City. Montreal is the largest city, port, and railway center of Canada. An important function is the bulk handling of wood pulp, newsprint, and grain from western Canada.

CENTRAL MANUFACTURING REGION

Central Manufacturing Region is the term used to designate the great industrial area that extends from the lower Great Lakes to the Ohio River and from Pittsburgh to St. Louis. It is a region of diversified manufacturing, ranging from basic iron and steel to the processing of agricultural products. Within it are large industrial cities, and at the same time towns having a single modest-scale factory. Furthermore, the regional economic structure rests on a sound and substantial agricultural base.

Most of the region was part of the French



St. Lawrence Valley; Coastal Plain: index map

colonial domain, hence of limited availability to Anglo-Americans of the English seaboard colonies. Even after the removal of the French in 1763, British authority attempted to reserve the area for the Indians. It took the American Revolution to open the way to a flood of settlers. Initially the Ohio River was on the main route of ingress; from it settlement moved up north-bank tributaries. Enough of this early migration stemmed from Virginia to lend a decided southern leavening to the character of settlements and people. The easier route along the Mohawk was of little significance until after the War of 1812. Its opening brought a new flood of settlers dominated by people of New England origin or descent. Their influence can still be distinguished in the architecture and folkways of the northern margin of the region.

Early agriculture provided cash returns from corn, hogs, wheat, tobacco, and their derivatives, such as whiskey, bacon, and flour. The most easily reached market was New Orleans. Not until the building of canals and railroads did the eastern seaboard cities draw directly the bulk of the products of this rich agricultural hinterland.

Present-day agriculture is descended from that of pioneer days. General farming is dominant, with medium-sized farms producing corn, grains, hay, and livestock. The production of fruit in Michigan, Ontario, and New York is one of numerous specialties reflecting factors of location or natural conditions.

The growth of manufacturing first gained im-

petus after the Civil War. The extension of railroads and a general expanding economy and population brought to the fore advantages possessed by the newer region west of the Appalachians. Initial success provided congenial atmosphere for new enterprises, so that, for example, the automobile age, born about 1900, found nurture in an area experienced in building carriages and internal-combustion engines.

The advantages of the region for manufacturing are many. It has raw materials in the form of coal, petroleum, limestone, and cheap Lake Superior iron ore. Transportation facilities are superb, lake and river, railroads and highways. Within it are the centers of population of the United States and Canada. It overlaps the margin of the continent's richest agricultural area, the Corn Belt.

Urbanization has kept pace with the expansion of industry. In 1950 the region had nearly 30 cities, each with more than 100,000 population, not to mention such behemoths as Chicago and Detroit. Centralization was natural and necessary in the early manufacture of a complicated machine. Now it is possible technically and desirable for numerous reasons to decentralize the making of the many parts of even more complicated machines. The present tendency to plant small-scale industries in villages and towns may result in slowing the growth of the great urban centers or can even lead to their decline.

Widespread as industry is in the region, in few instances is it so continuous over long distances as to be uninterrupted by the agricultural countryside. Neither is the nature of industry the same throughout. In the following sections is a breakdown into subregions on the basis of dominant industrial character.

NIAGARA DISTRICT The Niagara district surrounds the western half of Lake Ontario. Site advantages are excellent transportation facilities, both water and rail, and proximity to a source of hydroelectric power, Niagara Falls. Indicative of diversity of manufactures are optical goods in



Central Manufacturing Region:
index map

Rochester, and Canadian branches of various United States firms in and around Toronto.

Buffalo (0.58 million; metropolitan, 0.86) is the largest city. It has electrochemical as well as basic iron and steel industries. Buffalo is one of the nation's top-ranking cities in flour milling.

PITTSBURGH STEEL DISTRICT This district, centered about Pittsburgh, includes portions of Pennsylvania, West Virginia, and Ohio. It is the leading iron and steel producer of the nation, but is also important in the manufacture of tires, glass, and ceramic wares.

Pittsburgh (0.67 million; metropolitan, 2.1) lies at the long-important head of the Ohio in an area producing coking coal.

Cleveland (0.91 million; metropolitan, 1.22) is a Lake Erie port receiving iron ore and limestone and shipping coal.

AUTOMOBILE DISTRICT This district includes southern Michigan and adjacent parts of Ohio and Indiana. It suffers somewhat by reason of too great concentration on automobiles and lack of diversified manufactures. Even the bulk of the iron and steel used in fabrication is obtained from other districts.

Detroit (1.84 millions; metropolitan, 2.7) is situated at the point where only the Detroit River separates the United States and Canada, but is offside with respect to the main east-west lines of travel across the country. The early localization of the automobile industry in Detroit was due to a tradition of carriages and marine engines plus the presence of pioneers in the field, such as Henry Ford, R. E. Olds, Gaston Chevrolet, and others.

MIDDLE OHIO RIVER DISTRICT This subregion of diversified manufacturing is oriented toward

the Ohio River rather than toward the Great Lakes. However, rail and highway are far more important than water transport. The district does not produce basic iron and steel, but rather, tools, refrigerators, computing machines, radios, clothing, whiskey, and beer.

Cities are comparatively of moderate size; they include: *Cincinnati* (0.50 million; metropolitan, 0.79), the largest; *Indianapolis*; *Columbus*; *Dayton*; and *Louisville*.

THE ST. LOUIS DISTRICT The St. Louis district coincides with a concentration of population and industry on the Mississippi at the mouth of the Missouri and near the mouth of the Ohio. There is also a convergence of rail lines. Among varied manufactures are shoes, chemicals, glass, engines, and beer.

St. Louis (0.852 million; metropolitan, 1.58) is the single large city in the district. Founded by the French, St. Louis is true to tradition in remaining a fur-marketing center.

CHICAGO DISTRICT Oriented around the southern end of Lake Michigan, the Chicago district profits from excellent transportation facilities and proximity to coal, petroleum, and the highly productive Corn Belt. Industry ranges from basic iron and steel to meat packing. There are two large cities, Milwaukee and Chicago.

Chicago (3.6 millions; metropolitan, 4.6) is the second largest city and major railroad center of the United States. It is a close second to the Pittsburgh district in iron and steel production, is the chief manufacturer of farm implements, and has the largest meat-processing establishments.

54: Eastern Anglo-America

THE COAST PLAIN

As a natural feature the Coast Plain is a belt of lowland lying between the sea and a clearly defined inner boundary marking the ascent to higher and older lands. Its effective northern extremity reaches New York City; on the southwest it reaches and passes the Rio Grande. The average width along the Atlantic seaboard is about a hundred miles. To the south the plain broadens to include all of Florida and Louisiana, and extends inland as the Mississippi Embayment to the mouth of the Ohio. It is wide in eastern Texas, narrowing to about 250 miles along the western coast of the Gulf of Mexico. (See page 547.)

Common to all parts of the Coast Plain are low elevation and low relief, adequate to abundant precipitation, hardwood swamps and sandy pine uplands, and, girdling the coast, marshes and beyond them seaward a line of sandy barrier islands. The young sedimentary rocks yield a variety of mineral wealth, petroleum, gas, salt, sulphur, and phosphates.

As a cultural region the Coast Plain possesses no such degree of unity. Agriculture is the common form of land utilization, and on the immediate coast are the varied activities expected in such a location, commercial fishing, recreation on the sandy beaches, and the handling of maritime commerce in port cities. Beyond these general similarities the cultural activities and patterns are such as to necessitate the division of the Coast Plain into three subregions: the North Atlantic Coast Plain, the Cotton Belt, and the Subtropical Coast.

NORTH ATLANTIC COAST PLAIN The subregion so designated extends from New York City to the southern boundary of Virginia. Inland it reaches but does not include the Fall Line cities: New York, Philadelphia, Baltimore, Washington, and Richmond.

The plain is here notched by an invasion of the sea into a pattern of bays, estuaries, and tidal rivers that carry deep-water ships to its inner margin. The land itself is mediocre in its natural endowment. On the debit side may be cited poor soils and the absence of forest or mineral wealth.

To its credit the area has a comparatively long growing season, excellent fisheries, and attractive sandy beaches.

Culturally the subregion embraces tidewater Virginia, with its aristocratic tradition of one-crop plantations, and a portion of the originally non-English, peasant-artisan middle-Atlantic area. Justification for combining the two rests upon the negative characteristics of sparse, declining population, and the absence of great cities; and upon the positive likeness effected by a common and recent emphasis on the production of vegetable crops.

The decline of tidewater Virginia due to soil depletion was noted for colonial times. The abolition of slavery further contributed to the decay of the old plantation system. Agriculture settled down to the use of the better land for general crops, preserving something of the old ways in the use of Negro labor and in the unbridged gap between large and small landowner. Parallel changes in the northern section of the plain saw the abandonment of thousands of acres of marginal land and the rise of a class of backwoods "pineys."

The unifying development of vegetable production has come largely since 1920. It is favored by the early growing season and the proximity of large centers of population. With the new land utilization there has developed a distinctive pattern of small, intensively cultivated fields; packing, canning, and quick-freeze establishments; and fast, modern means of transportation. Even so, the older traditions have not been entirely obliterated for, in distinction to the northern, the southern section employs Negro labor and moves in more leisurely fashion.

Independent of agricultural changes and developments are the fisheries, which reach a climax of excellence in Chesapeake Bay. Both food fish and rough fish for fertilizer are caught, but most significant in value is the oyster. The bay is the chief producer of this shellfish that ranks second only to salmon in value among all American fisheries.

It was noted that the North Atlantic Coast Plain is without great cities. Even the larger urban cen-

ters that the subregion does contain are not the products of their immediate environment. *Atlantic City* (64,000; metropolitan, 100,000) is almost purely a resort city, drawing tourists from all parts of the nation. *Norfolk* (182,000; metropolitan, 471,000) is the largest of a cluster of three ports lying near the mouth of James River at the lower end of Chesapeake Bay. Most important of port functions is loading ships with coal brought by rail from west of the Blue Ridge. Shipbuilding and processing imports are likewise activities independent of the port's immediate hinterland.

THE COTTON BELT The remainder of the Coast Plain with the exception of an elongate but narrow strip of subtropical coast is termed the Cotton Belt. Although the Cotton Belt as thus delimited is all part of a single physiographic province, the Coast Plain, extensive growing of cotton extends outside it only in the Carolina Piedmont and in the interior plains province of Texas and Oklahoma. Even so, the limits of cotton production are more climatic than physiographic. The northern boundary agrees closely with the isotherm of 32° F. for January, or even better with the line of the 200-day growing season, while the southern boundary is a rainfall of 10 inches during autumn. In brief, the Cotton Belt has a long growing season and a dry fall.

The unity given the subregion by the dominance of cotton as a cash crop came with the invention of the gin and a tremendous demand for the newly cheap textile fiber. Other crops were abandoned in favor of cotton. The need for labor gave slavery new economic importance. The plantation pattern became firmly established in areas of better soils, such as the Black Belt of Alabama, and later, the delta lands of Mississippi. The poorer sections were the domain of the small farmer. Together farm and plantation overwhelmingly dominated world cotton production at the time of the Civil War.

The War marked a turning point in the economic well-being of cotton production. The substitution of sharecropping for slavery accelerated soil wastage. The imposition of stiff import tariffs to foster northern industry was a handicap to the exporting Cotton Belt. The spread of the boll weevil in the twentieth century was but an added push down the long road of decline. The social effects were such as to create at their worst rural slums as bad as those of any city.

It seems unlikely that the Cotton Belt can ever again control the world market for cotton. The cost advantages gained by mechanization through the cotton picker are but temporary. Government subsidy is false prosperity. Cotton must be re-

stricted to areas best fitted for its economical production. How to utilize the bulk of the subregion imposes many problems whose solution is slow. Long-abused soils await reclamation. The progeny of the nation's highest birth rate must be fed and educated, and provided with opportunities if they are to remain in the subregion and aid in its rebuilding. Hints at answers to the many questions are emerging in the form of saner attitudes toward the land; newly significant crops such as sweet potatoes, peanuts, peaches, and pecans; livestock improvement; an increase in dairying; and new developments in forestry.

Regarded by many as the cure of all the ills of the Cotton Belt is industrialization. The subregion has advantages for manufacturing in an abundant labor supply; mild winters; natural gas; and raw materials such as petroleum, timber, and cotton. On the other hand, there are disadvantages in the form of distance to the richest markets; the absence of coal; long, hot summers; and lack of technical skills. Rapid expansion of industrialization has marked recent years, with the steady addition of plants and factories involving petroleum, chemicals, paper, textiles, aluminum, synthetic rubber and tires, and tractors. A part of the recent gain is war fostered; its full retention in times of peace is problematical.

Urbanization has as usual accompanied industrialization. The former is as recent as the latter. As late as 1870 there was no Cotton Belt city with a population of 100,000 or more. At the present writing nearly a dozen cities approach or exceed that figure. *Dallas* (433,000; metropolitan, 470,000), *San Antonio* (406,000; metropolitan, 417,000), and *Memphis* (394,000; metropolitan, 403,000) are among the modern, bustling metropolitan centers; as such they are a far cry indeed from the courthouse towns of the traditional cotton South.

THE SUBTROPICAL COAST This subregion differs both naturally and culturally from the other subregions of the Coast Plain. Implicit in the name is a climate that approaches the tropical in length of growing season and mildness of winter temperatures. The coastal location means low elevations and relief, extensive swamps and marshes, sandy barrier beaches, and generally abundant precipitation. Culturally the Subtropical Coast has been marked by erratic and special utilization, with port cities of a size quite out of keeping with the meager development of their immediate hinterlands.

The founding of early city ports such as *Charles-*

ton, Mobile, and New Orleans fostered local experiments with various commercial crops: indigo, rice, sugar cane, and cotton. Rice and subsequently sea-island cotton became established crops on the Georgia-Carolina coast. In south Louisiana sugar cane attained importance in the latter part of the eighteenth century; technical advances in refining led to rapid expansion of sugar plantations in the rich delta lands. Over most of the Subtropical Coast, however, population remained scant and utilization restricted. Fishing, cattle grazing, and the extraction of naval stores did not reach intensive proportions.

Especially during the last fifty years the Subtropical Coast has expanded greatly in population and commercial activity, in some cases at boom tempo. In part the growth rests upon the rehabilitation or extension of old enterprises; in other instances upon something entirely new to the area.

The present distributional pattern of agriculture finds sugar cane still dominant in coastal south Louisiana, with a recent extension into Florida. Southwestern prairie Louisiana is devoted to rice. Florida, delta Louisiana, and the lower Rio Grande Valley produce citrus fruits and early vegetables. Scientific forestry and tung oil and pecan groves are utilizing poor or worn-out lands. The beef cattle industry has revived with the assistance of tick-fever control and improved breeding.

The extractive industries have at least kept pace with the growth of agriculture. Second-growth forests keep vigorously alive one of the region's oldest occupations. The whole coast produces fish of choice quality. The waters adjacent to the Mississippi's mouth are the leading source of shrimp and an important producer of oysters. The Louisiana marshes continue to yield the bulk of the continent's muskrat catch. But all these combined are insignificant in comparison with the wealth of minerals produced in the region: phosphates in Florida; salt in Louisiana; sulphur in Texas and Louisiana; and, above all, petroleum and natural gas. The first well was "brought in" in Texas at the beginning of the century; producing oil fields now dot coastal Texas and Louisiana, and promise to extend farther eastward. Nothing else has done so much to alter the landscape or to lend momentum to industrial enterprise.

Manufacturing in the Subtropical Coast has reached about the same stage of development as in the Cotton Belt. Only recently has it gone much beyond processing the yield of extractive industries and agriculture. Lumber, naval stores, meat, hides, furs, sugar, and shellfish were supplemented

chronologically by pulpwood, paper, salt, and sulphur. Petroleum and natural gas are the foundations of the present-day manufacturing expansion. The modern refinery produces not only gasoline and lubricating oil, but also the ingredients of synthetic rubber and a variety of chemicals. The supply of natural gas is more than adequate to meet the needs of industrial power. Even a secondary iron and steel plant is in operation at Houston. Some of the shipyards established along the Gulf Coast to meet war needs are scenes of revived activity resulting from prolonged international political unrest.

Many of the old city ports have been worsted in the race for urban-industrial growth. *Charleston* (71,000; metropolitan, 99,000); *Savannah* (119,000; metropolitan, 125,000); and *Mobile* (127,000; metropolitan, perhaps 200,000) have declined relative to the gains of both old and new urban centers. *New Orleans* (568,000; metropolitan, 602,000), an important port for 200 years, has lost its place as the subregion's largest city by a modest but growing margin. New Orleans owes its significance to the control of the Mississippi Valley route to and from the continental interior, and its chief economic function is as an entrepôt, the handling of incoming and outgoing cargoes.

Houston (594,000) is New Orleans' chief rival. Houston's spectacular growth began with the construction of a ship canal to the Gulf of Mexico early in the twentieth century. The new port drew cotton, wheat, and petroleum for export. The city is today the center of the most thriving industrial district of the Subtropical Coast.

Miami (247,000) is illustrative of a type of urban growth not previously discussed for the Subtropical Coast. Almost its sole function is catering to tourists, an industry reflecting mild winter temperatures and sandy ocean beaches. Other resort centers dot the Florida, Mississippi, and Texas coasts.

THE PIEDMONT

The Piedmont borders the inner Coast Plain for a distance of some thousand miles from New York City to central Alabama. To the west it abuts against the Blue Ridge, leaving an average width of about a hundred miles, narrow at the north, widest in the Carolinas. The eastward, Fall Line, boundary stands at tidewater as far south as central Virginia; it rises to 500 feet in Georgia.

The Piedmont is hilly or rolling land, with streams rather deeply cut, particularly in its southern portion. Soils are generally of limited productivity due to their shallowness. Mineral resources

are unimportant. Water power is significant in the Carolina Piedmont, but only because of unusual development of a limited potential.

Culturally the whole region shows little unification. The best simple division is a Northern Piedmont, reaching from New York slightly into northern Virginia, and a Southern Piedmont for the balance of the region. The distinction rests upon different patterns of rural living and difference in degree of industrialization and urbanization.

THE NORTHERN PIEDMONT This is a land with a substantial agriculture practiced by small farmers largely of non-English origin. The crops are varied; wheat, corn, tobacco, with livestock and concessions to the proximity of dense urban populations in the form of dairying, poultry, eggs, and potatoes. Centering on the limestone soils of Lancaster County, the Pennsylvania "Dutch" have created a rural scene that is one of the few in the nation giving an impression of productive permanence.

However excellent the agricultural base, the degree of urbanization represented by New York, Philadelphia, Baltimore, and Washington is no product of the Piedmont. The first three have much in common as to extraregional relations and historical development.

Washington (792,000; metropolitan, 1.21 million) is a purely political creation for the nation.

New York City (7,842 million; metropolitan, 12,869) is the focus of population, finance, and industry for the nation and the western hemisphere. Its population is largely recent-American in composition, yet it could exist in such heterogeneity in no other country. New York is the chief industrial center of the United States, yet it lacks basic iron and steel production. It sets urban standards in the way of tall buildings, subways, and elevated railroads. It dictates styles of living and thought.

As a city, New York was long tertiary to Philadelphia and Boston. It lacked the excellent agricultural environment of the former; it did not match the maritime interests of the latter. Its march to outstanding dominance began in the first third of the nineteenth century with the building of the Erie Canal and New York Central Railroad along the best route to the interior of the continent. The development of the trans-Appalachian West found New York at the small end of the funnel through which traffic could most easily flow. So important to New York's well-being is the matter of location, that it is doubtful if even the inertia of long preeminence could offset a marked change of values in this respect. A successful Great Lakes-St. Lawrence seaway or a

revived Mississippi Valley route might well effect a reshuffling of urban rank.

Philadelphia (2,507; metropolitan, 3,373) and *Baltimore* (0,940; metropolitan, 1,306) differ from New York in degree rather than in kind. Each tried by means of rail and canal construction to match New York's command of traffic with the interior. Each is today an important port joining rail and ocean shipping. Each has varied industry and manufacturing. Unlike New York, both Philadelphia and Baltimore have access to basic iron and steel production, Philadelphia with Bethlehem, and Baltimore with Sparrows Point.

THE SOUTHERN PIEDMONT This division is part of the South. Although the tidewater plantation system never dominated the Piedmont, there are a landed gentry, yeoman farmers, rural Negroes, and "poor white" sharecroppers. These various elements are by no means evenly distributed, but change progressively from north to south together with transitions in crops and planes of living.

From middle Virginia north is a subsection of commercial apple orchards and livestock. The treatment of the land is generally judicious; the level of living is comparatively high. The countryside is sufficiently attractive to bring northerners



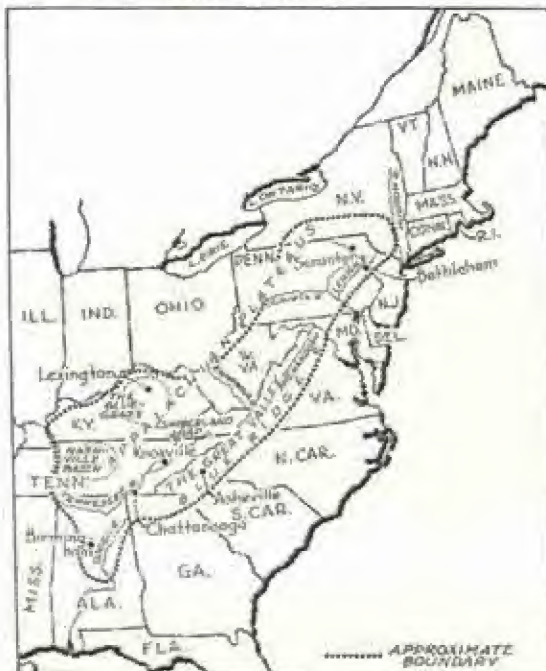
Piedmont: index map

who buy land and join the varied activities of the country squires.

Very different are the central subsection extending from middle Virginia to central North Carolina and the southern subsection reaching southward to the limit of the region. The central subsection produces tobacco as a commercial crop; the southern, cotton. Alike are these two divisions in a terrible wastage of land through soil depletion and erosion; too they are similar in the depressing poverty and widespread deficiency diseases of their inhabitants.

In contrast to the rural poverty is the localization within these latter two subsections of the most heavily industrialized area of the South, with accompanying cities that are attractively modern. The district is first in the nation in the manufacture of cigarettes and cotton textiles; it is significant in the production of furniture, knit-goods, rayon, fertilizer, pulp, and paper.

Piedmont industrialization is a matter of the last half-century. Attractions to capital were local production of bright cigarette tobacco, cheap hydroelectric power, mild winters, and, above all, an abundance of cheap, unorganized labor provided by poverty-stricken sharecroppers and mountaineers. Although the latter advantage has been largely dissipated by wage increases, industrial expansion continues at a rapid rate.



Appalachian Region: index map

So far, industrialization in the Piedmont has produced no great urban agglomerations, because the individual factories tend to be dispersed rather than concentrated. Hydroelectric power and highway trucking have robbed established railroad centers of any great advantages. Modest-sized *Winston-Salem* (less than 100,000), the cigarette-manufacturing capital of the nation, and *Charlotte* (0.133), a leading cotton-textile center, are the largest cities of the new industrial district. *Richmond* (0.230) is much older in its industrialization. Its manufactures range from tobacco products to locomotives. It is a minor port and important railroad center. *Atlanta* (0.327; metropolitan, 0.498), the largest city in the Southern Piedmont, is a product of the railroad age, since it is a crossroads for lines rounding the southern end of the Appalachians. Primarily a commercial city, Atlanta's manufacturing industries are nevertheless varied and important.

THE APPALACHIANS

West of the Piedmont lies the largest area of hills and mountains in eastern Anglo-America. To this the term Appalachians is often loosely applied, although three distinct natural elements: Blue Ridge, Folded Appalachians, and Appalachian Plateaus, in that order from east to west, comprise the region. Steepness of slope, a heavy forest cover, and abundant precipitation are the natural qualities most common to the three elements, and even to these there are exceptions. Coal, petroleum, and iron ore, the most important minerals occurring in the region, are unevenly distributed, and the same is true of the limited appearance of good soils.

Cultural unity of the region exists only in broad terms. Agriculture is the most widespread occupation, but mining and manufacturing are important. Old-stock Americans are numerically dominant, but recent immigration is well represented in northern sections. More significant is the character of agriculture. Wheat, corn, apples, and livestock reach to the very southern boundaries of the region, where adjacent lowlanders may be producing cash-crop cotton or tobacco. With these "northern" crops goes a pattern of small, owner-operated farms, with Negroes and tenancy at low ebb and subsistence agriculture at a maximum for the nation.

Cultural diversity is such as to preclude a common discussion for the whole region. The most practical method is to follow the physiographic division into three elements, even though cultural similarity has limited respect for natural boundaries.

THE BLUE RIDGE The Blue Ridge is the highest and roughest part of the Appalachian Region. On its southern flank the annual rainfall reaches 80 inches. The mountains are mantled by a heavy forest that obscures all but the steepest slopes. There is a minimum of level ground. Mineral deposits of commercial importance are few.

Into this land of natural beauty and limited resources came English yeomen, refugees from the plantations and slavery of the Coast Plain. They were joined by Scotch-Irish, Germans, and Huguenots from the stream of migrants descending the Appalachian Valley. Isolation welded the diverse elements into a homogeneous group having a folk pattern crystallized largely around the customs of their British ancestors. Speech, the feud, song, story, dance, arts, and crafts were fixed as of the time of their retreat into the mountains.

The economic base was subsistence agriculture: corn, wheat, apples, sorghum, and livestock, with corn whiskey the nearest approach to a cash crop. The farmers were also artisans and craftsmen, at least to the extent of supplying their own needs. Plantations, slavery, and, in fact, the whole lowland way of life were something more than foreign to the mountaineer. For them he had such positive dislike that the Civil War found his sympathies actively with the North.

A high birth rate combined with a reluctance to leave the mountains caused the spread of agriculture to every bit of flat ground and to slopes too steep for permanent cultivation. Erosion and declining agricultural yields resulted in a general poverty matching that of the Southern Piedmont. There was no local mineral industry or manufacturing to provide relief.

Today the Blue Ridge is a major problem area as to both land and people. Families are still large and mere existence is difficult. Despite these distressing circumstances, the Blue Ridge is attractive naturally and interesting culturally. It is a living museum of old Americana. Here is a southern stronghold of the Republican party, in contrast to the Democratic affiliations of the lowland about it. The mountaineer likes his land and way of life. Only direct need forces him to move permanently to the mill cities of the Piedmont.

Urbanization is obviously not to be expected as the product of such a background. Only in the south where the mountains broaden to a plateau is there reason for even a moderate-sized city. *Asheville* (.051; metropolitan, .076) is primarily a summer tourist center with modest industrial development.

THE FOLDED APPALACHIANS West of the Blue Ridge is a belt of alternating ridges and valleys.

The belt has an average width of fifty miles and it extends from the Hudson River to central Alabama. In some sections the ridges overshadow the valleys; in other sections the reverse is true. However, one feature is sufficiently continuous throughout the length of the subregion to have a general name, the Great Valley. Locally it bears the name of the stream that occupies it, such as Coosa, Tennessee, Shenandoah, or Lehigh. The Great Valley lies on the eastern or Blue Ridge side of the Folded Appalachians. It owes its position to a concentration of folded limestones whose comparatively rapid weathering formed the valley and floored it with productive soils. West of the Great Valley is a series of sandstone, shale, and conglomerate ridges separated by lesser limestone and shale valleys. Unlike the Blue Ridge, the Folded Appalachians subregion has industrially significant mineral deposits in its limestone, iron ore, and anthracite coal.

The Folded Appalachians became culturally important when settlement pushed west of the Piedmont and Blue Ridge. The Great Valley became a corridor directing a stream of land seekers. From it tributary routes led up the Juniata to the headwaters of the Ohio, or down the Kanawha to the same destination, or through Cumberland Gap to the Bluegrass and Nashville Basin. Some settlers turned eastward into the Blue Ridge or pushed beyond to the Piedmont. Since the broad opening to the Valley is in Pennsylvania, where the Blue Ridge breaks down, Scotch-Irish and Germans landing in Philadelphia followed the obvious path, to contribute greatly to the character of the new settlements.

The Folded Appalachians were themselves populated at a comparatively early date. The best agricultural lands were by no means invariably settled first. Difference of settlers' backgrounds and the vagaries of fate brought some to productive limestone valleys and others to sterile shaly ridges. The limitations and possibilities of different local environments aided to differentiate strongly subsequent agricultural development. Finally, exploitation of minerals and industrialization, both of them restricted areally, have further contributed to the variety of occupance patterns.

Agriculture remains by far the most widespread form of land use. In the Great Valley it is successfully commercial. On the ridges and in the poorer valleys it is similar to the impoverished subsistence agriculture of the Blue Ridge. In nature the agriculture is general farming: wheat, corn, livestock, and hay, with local specialties such as apples in the Shenandoah Valley and

dairying near cities. Cotton as a cash crop appears only in the extreme southern part of the sub-region.

Industrialization and urbanization have developed extensively only at the two ends of the Folded Appalachians, and even there the largest individual city (*Birmingham*, 0.299; metropolitan, 0.502) ranks only thirty-seventh in size nationally. In Pennsylvania, extending southward from *Scranton* (0.125; metropolitan, 0.536) are the continent's only important deposits of anthracite coal. In the Lehigh Valley of the same state Great Valley limestone is the basis of an old and still important cement production. At *Bethlehem* (0.050; metropolitan, 0.338) are the largest iron and steel works east of Pittsburgh.

Birmingham owes its development to a happy coincidence of coal, iron ore, and dolomite. It produces steel cheaply for the market available to it, which has been sufficient to foster the city's phenomenal growth.

Of special interest because it may presage similar government projects is the Tennessee Valley

Authority. As a by-product of flood control and navigation improvement the TVA has an abundance of electrical power to sell cheaply. A growing Knoxville industrial district specializes in textiles and chemicals, while Chattanooga adds varied industries to its importance as a transportation center.

THE APPALACHIAN PLATEAUS The third division, the Appalachian Plateaus, extends from the Lake Erie plain to northern Alabama and from the Folded Appalachians to the upper Ohio Valley and central Tennessee. Excluded are the northern plateau margins, which by reason of industrialization are considered part of the Central Manufacturing region.

The Appalachian Plateaus possess a measure of natural similarity in the form of high degree of dissection and deeply entrenched valleys; prevailing steep slopes; heavy forest cover; abundant precipitation; and excellent resources in coal and petroleum. Beyond these generalities there is infinite variation; glaciated and non-glaciated sections; sharp stream divides and broad flat ones; mild and cold winters,



Coal mining settlement, northern Appalachians (U. S. D. A. photograph by Ackerman)

Culturally there is unity in an unsuccessful attempt to foist on a rough country a system of agriculture adapted to flat lands; in the coal-mining towns dotted over virtually the whole region; and in the absence of urbanization and industrialization. Man has fared none too well in the Appalachian Plateaus and the land has suffered under his administration.

Agriculture is at its best in the New York section of vineyards, apple orchards, general farming, and dairying. From New York to northeastern Kentucky general farming leads to decreasing yields and abandoned land. Here too is the densest grouping of coal-mining towns, representing for the miners but slight advantage over tilling the unproductive slopes. Further south are the "mountains" of Kentucky and central Tennessee, where the impoverishment of both land and people matches that described for the Blue Ridge. Here are the same high birth rate and prevalence of deficiency diseases, an abject poverty that is little relieved by mining and lumbering.

Urbanization is so little a part of the Appalachian Plateaus that no mention is made of the few unimportant exceptions. They should not be permitted to obscure the picture of a poor land bursting with an excess of poor people who must struggle to secure a poor existence out of a reluctant soil.

By way of contrast is the opulence of the Bluegrass and Nashville Basin, two subregions that are partially enclosed by the western rim of the Plateau. The original settlers of Plateau and lowland were precisely of the same stock. In the two lowlands excellent soils and comparative flatness of slope support a standard of rural living that is hardly exceeded elsewhere in the nation, and cities such as Lexington, prosperous, refined, and free of obtrusive evidence of human poverty. The contrast between upland and lowland is an illustration of man's failure to alter his traditional ways in the face of unfavorable natural conditions. Had Swiss mountaineer peasants settled the



Appalachian farmstead (U. S. D. A. photograph by Forsythe)

Appalachians, the course of development would most certainly have been different.

PRAIRIE PLAINS

Prairie Plains is a physiographic term. It is used here to designate the distinctive agricultural heart of the continent. With minor exceptions the boundaries of one agree with those of the other. The region is shaped like a crude triangle whose longest leg is the 100th meridian. Its eastern apex is St. Louis. One of the short legs runs irregularly northwest from St. Louis through Winnipeg. The other extends southwestward to reach the 100th meridian in central Texas.

Excluded from the region are eastern Illinois, Indiana, and western Ohio, an area that is agriculturally part of the Prairie Plains but is detached from it on the basis of intensive industrialization. Marginal are the Ozark-Ouachita Highlands, a

region strikingly similar both naturally and culturally to the Appalachians.

Peerless advantages for agriculture are inherent in the character of the land. The surface is generally flat, and in places extends for miles without a significant break. Natural vegetation is tall-grass prairie interspersed with groves of trees or riverine woods. The soils are deep and of excellent quality. Rainfall is adequate and well distributed seasonally. In the northern section winters are sufficiently severe to check erosion and halt leaching. Supporting natural resources are petroleum, gas, and coal, abundant in the southern part of the region.

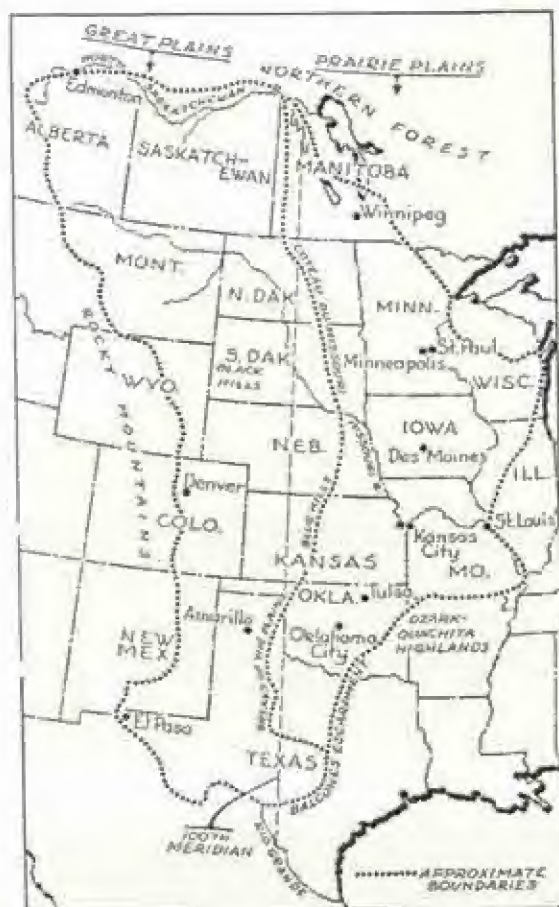
Agriculture overwhelmingly dominates the man-made landscape. One cultivated field adjoins another in unending succession. Crops are uniformly luxuriant. Thorough and orderly husbandry conveys an impression of solidity and richness.

Strange to the eye of the easterner is the pattern of occupancy. Country roads oriented to the cardinal directions delimit rectangular or square farms and fields. A cluster of buildings borders the road about every quarter mile. They too stand square with the compass. Barns are large, substantial, and painted red. The houses ordinarily sacrifice beauty to utility. Trees are restricted to small orchards, wood lots, or windbreaks guarding the buildings. A sea of corn is broken by islands of grain or hay, and by feed lots occupied by fat beef cattle or fatter hogs. Every few miles there is a crossroads or railroad village.

The scene described is a type of occupancy pattern most frequently encountered in Iowa. The Corn Belt, of which Iowa is the heart, extends northward into southern Minnesota and southeastern South Dakota; westward to include parts of Kansas and Nebraska; southward into northern Missouri; and eastward through Illinois beyond the boundary of the region. Still within the Prairie Plains, corn-hog economy is succeeded on the northeast by dairying; by wheat on the north and west; and on the south by cotton.

Crop changes do not challenge the essential cultural unity of the region. There is a sameness, a uniqueness that transcends even the common natural base and finds explanation only historically. When settlers from the forested seaboard reached the grasslands they encountered problems for which they had no traditional solutions. Furthermore, they entered a country where the new square township survey had been applied to favorable terrain.

The forced formulation of new ways plus isolation encouraged further break with eastern tradition. The result was the creation of a largely



Prairie Plains; Great Plains; index map

new and distinctively American pattern of living. Although the northern part of the Prairie Plains has received a large immigration directly from Europe, weak ties with the Old World and deep loyalties to the new are everywhere evident. The region expresses itself not only in the material pattern of a remunerative agriculture practiced on flat, rectangular fields, but also in a minimizing of social distinctions and a leaning toward snug political isolationism.

Industry and commerce in the Prairie Plains are concerned primarily with the needs of agriculture. Supplying the farmer's requirements, and handling and processing his crops and fattened livestock employ most persons not directly engaged in agriculture. An important exception is the considerable number employed by the coal-mining and petroleum industries. Large-scale manufacturing for national needs, while present, is relatively unimportant. Urbanization accordingly lags. Indicative of the situation is the fact that *Des Moines*, by far the largest city in Iowa, the focal state of the region, had a 1950 population of 177,000, and ranked fifty-third in the nation. Brief mention is made of four Prairie Plains cities in order to point out the variety of urban functions.

Winnipeg (0.229) lies on the boundary between Prairie Plains and Northern Forest. It is a railroad center for lines fanning out to the wheat-producing prairies west and northwest of the city.

Minneapolis-St. Paul (0.517 and 0.310, respectively; metropolitan, 1,006) lie at the site of the former Falls of St. Anthony, the natural head of navigation on the Mississippi. Excellent rail connections make the Dakotas and Montana their commercial hinterland. Flour milling is second in national importance only to that of Buffalo.

Kansas City (Mo., 0.453; Kans., 0.130) lies on a big bend of the Missouri River, the eastern terminus of both the Santa Fe and Oregon trails. It is one of the leading commercial and rail centers for the Southwest. It specializes industrially in meat packing and flour milling.

Oklahoma City (0.242) is a secondary transportation center. Reflecting varied production in the city's immediate hinterland are flour milling, meat packing, cotton-seed oil production, and petroleum refining. Oklahoma City's multiple economic interests give it a commanding lead over its rival, *Tulsa*, a city whose growth is almost entirely due to the petroleum industry.



Corn Belt feed lot (U. S. D. A. photograph)

55: Western Anglo-America

THE GREAT PLAINS

The Great Plains region lies between the Prairie Plains and the Rocky Mountains. At the north it adjoins the Northern Forest near the North Saskatchewan River; at the south it reaches the Rio Grande. The boundary between Prairie Plains and Great Plains is set at the 100th meridian, a highly arbitrary line. In this land of little local relief the selection of a satisfactory boundary, either cultural or natural, is difficult. An abrupt rise in elevation westward that approximates the 100th meridian is effected by the Balcones Escarpment and the breaks of the plains in Texas, the Blue Hills Escarpment in Kansas, and the Coteau du Missouri extending northward from Nebraska.

But the boundary is unimportant. The heart of the Great Plains is different from Iowa. There is a rise in elevation westward from a few hundred feet to nearly a mile at the base of the Rockies. The stream pattern grows coarser. Trees are fewer until they disappear entirely. Tall-grass prairie yields to plains short grass and bunch grass. Precipitation drops from 35 inches to half that figure. Buttes, mesas, badlands, sand hills, canyons, and other landmarks of an arid climate interrupt the flat or gently rolling surface. The isolated Black Hills, with their conspicuous mantle of western pines, serve as an introduction to the Rocky Mountains. Even the soils lose their dark color in the Great Plains, changing from black through chestnut and brown to gray, with greater degrees of aridity westward. To widespread deposits of coal,

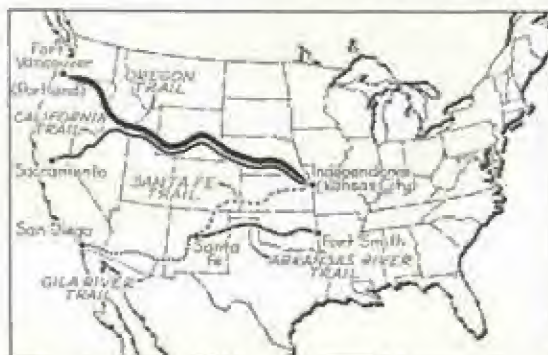
petroleum, and gas, familiar in the Prairie Plains, are added localized sources of salt, potash, and gold.

Culturally the changes are equally distinct. Population density declines steadily, and the occupation pattern is constructed on an ever-enlarging scale. Dry farming, irrigation agriculture, and range grazing are outside Corn Belt tradition. Industrialization and urbanization are at low ebb. Culturally the Great Plains region is something more than the exclusive product of the western movement of Anglo-Americans from the Atlantic seaboard.

The region was the habitat of bison-hunting Indian tribes. In part because of fierce resistance they kept their land free of white men longer than did any other comparable aboriginal group. A vanguard of trappers crossed the Plains to the Rockies in the eighteenth century. The Santa Fe Trail was opened in the 1820's; the Oregon Trail in the 1840's. Fear of the Indians and the rigors of the land confined travelling parties to the trails and hurried their progress through and out of the region.

The big changes came after the middle of the century, when development followed development in rapid succession. The government, torn between respecting the Indians' rights and protecting its own trespassing citizens, yielded to the inevitable and put an end to the Indian menace by the middle 1870's. Market hunting for hides reduced the bison to insignificant numbers about the same time. The land was open for developments already underway.

The end of the Civil War found south Texas overrun with wild longhorn cattle. Their local value was slight, but they could be sold at a profit if brought to eastern markets. Some were shipped by water but larger numbers were driven overland, along trails that became well established. The distance of the drives was reduced when railroads pushed west of the Mississippi. Each new railhead of the Kansas Central became the shipping point for Texas cattle. An expanding market and the elimination of Indian and bison brought new herds to populate the empty grazing lands of the more-northerly Great Plains. Cattle and



Old routes to the West

ranching methods, both borrowed directly from Spanish Mexico, were introduced as far north as Alberta. Unregulated open-range grazing and overstocking invited calamity. It came in the form of reduced feed and the decimating effects of severe winters. The bonanza period over, the grazing industry was forced to changed ways, particularly in the face of a new rivalry for the land.

Hard on the heels of the railroads came farmer settlers. They tried to apply traditional methods of agriculture to a semiarid land. Upswings in the cycle of precipitation brought optimism and success. Downswings sent thousands eastward, discouraged and penniless. Experience nurtured adaptations of older practices. Milo maize (grain sorghum) did better than Indian corn (maize). Dry farming, that is, fallowing the land a year or more between harvests, guaranteed better average yields than did constant cropping. Irrigation, where possible, offered a happy solution to the worst problem. Still, after a half century the question as to how the Great Plains shall be utilized is unanswered. A succession of rainy years and good markets bring an expansion of agriculture in the marginal lands. A reversal of conditions witnesses a sharp contraction, sometimes accompanied by the disaster of a Dust Bowl. Every bit of reliable evidence indicates that for most of the Great Plains, agriculture must be altered fundamentally in its methods, or abandoned entirely in favor of grazing, except in irrigable areas.

Out of the welter of success and failure, of experience with old and new ways, has emerged a series of rural patterns that compose the Plains countryside. Centered along the indeterminate zone joining Prairie Plains and Great Plains is the primary wheat-producing area of the continent. It is a larger-scaled Corn Belt, with differences. The farms are still rectangular, but they are bigger by the difference between 150 and 500 to 1,000 or more acres. Houses and roads are consequently farther apart. Corn has changed to wheat, wheat to the exclusion of fattening livestock. Complete mechanization has eliminated the horse and most of the hired help. The farmstead is simpler, with barns less prominent. The trees of the windbreak are the more conspicuous because there are no others. Towns are few and barren, visible from a distance because of the row of tall grain elevators along the railroad siding or a prominent water tank.

The rougher and drier country is still utilized for the range grazing of cattle, sheep, and goats. Here the economic units are still larger, from several thousand to more than a hundred-thousand acres. Corrals, windmills, haystacks, and other

appurtenances of the industry make the scene distinctive. The small towns have little in common with the agricultural villages further east.

Irrigated areas in the drier parts of the Great Plains are green oases set in drab surroundings. In them agriculture takes on a high degree of certainty. Higher costs of production necessitate intensive cultivation. Crops of cotton, alfalfa, sugar beets, small fruits, and vegetables call for considerable hand labor. The combination of cause and effect results in denser populations, pleasanter towns, and a concentration of activity foreign to the grazing and wheat-growing sections of the region. At the present time irrigated areas are scattered from Texas and New Mexico to Alberta. Their extension will contribute to the stability of Plains agriculture and it will crystallize a youthful Anglo-American pattern of occupation.

Totally unrelated to agriculture and grazing in its imprint on the landscape is the geologically conditioned exploitation of minerals. Oil fields dot the Great Plains from Texas and New Mexico to Alberta. Intensive exploration suggests that the entire region may become a major producer of petroleum and gas. Fair-quality bituminous coal is mined at a number of places between northern New Mexico and Alberta. The reserve of coal of all grades is the largest on the continent. Gold has been produced continuously since 1876 from the Homestake mine in the Black Hills.

The general sparsity of population and the absence of extensive urban industrialization leaves little reason for the growth of large cities. *Denver* (0.413; metropolitan, 0.471), the region's largest city, was founded to serve mining developments in the Rockies; it is still a major function. Additionally, Denver is an important meat-packing, commercial, and tourist center.

Illustrative of other cities and towns in the Great Plains are the following:

Edmonton (0.113) is an old fur post on the North Saskatchewan River. The city lies on the Canadian National Railroad, en route to the Yellowhead Pass across the Rockies. Edmonton is the center of the northern Canadian wheat area.

Amarillo (under 100,000) probably still merits the title of chief city of the Texas Panhandle over its rival, *Lubbock*. Amarillo possesses major livestock and agricultural interests, but its development is more immediately due to petroleum and helium production.

El Paso (0.130) lies at the pass used by the Spaniards to enter the upper Rio Grande Valley from Mexico. Commercial interests include live-

stock and irrigation agriculture. Local smelters utilize imported ores.

THE ROCKY MOUNTAINS

The Rocky Mountain region extends from the Sangre de Cristo Range of New Mexico to the Cassiar and Mackenzie ranges of northern Canada. To the east are the Great Plains and the Northern Forest. On the west is a series of plateaus, from New Mexico to British Columbia.

The Rockies are no simple physiographic unit. The Southern Rockies, from New Mexico to Wyoming, consist of two major systems of ranges and intervening basins or "parks." The Wyoming Basin lies between Southern and Northern Rockies

and provides an easy east-west passage from the Great Plains to the Plateaus. The Northern Rockies begin with a number of irregularly oriented ranges in Wyoming, to settle down to a series of parallel mountains and trenches in Montana and Idaho.

The Rockies are an island of contrasts to surrounding regions. They are well watered in the midst of aridity. In them originate major streams to flow east and west from the continental divide. A dominantly coniferous forest rises from the dry timber line of either flanking region up to a cold timber line that gradually loses elevation northward. In contrast to plain and plateau, there is a minimum of plane surfaces. Steepness of slope and sharpness of contour become more marked northward with the increasing dominance of ice sculpture. It is a region of scenic grandeur and cool summers in distinction to the hot summers and monotonous landscapes of adjacent regions.

Man's imprint on the Rockies is the result of a variety of endeavors: mining, grazing, agriculture, lumbering, catering to tourists, and attempts to solve the difficult problems of transportation in a steep country. Industrialization in the sense of urban manufacturing is as yet an undeveloped chapter in the history of man's occupancy of the region.

Spaniards from Mexico reached the upper Rio Grande Valley to establish permanent settlements in the seventeenth century. From their capital at Santa Fe they pioneered both irrigation agriculture and livestock ranching. Santa Fe became the mecca of traders venturing across the plains early in the nineteenth century. Taos, the Indian pueblo a few miles north of Santa Fe, was the favorite rendezvous of American trappers who claimed as their special domain the whole chain of the Rockies northward into Canada. The trappers' exclusive tenure of the vast region was short, for as early as 1835 there were complaints that the country was overrun by white men. However, the "mountain-men" trappers were the well-informed guides who established the trails and directed settlers to Oregon and California during the 1840's and subsequently.

Disappointed prospectors from California and those who never got west of the Rockies opened the mining era in the 1850's. Denver grew with Rocky Mountain mining developments in the late fifties. A rich placer-gold strike at Alder Gulch, Montana, in 1862 started a stampede of miners northward. The resulting demand for supplies brought steamboat navigation to the upper Missouri. So this dramatic epoch evolved. Early interest centered on placer gold. A discovery at one point was followed by a more-promising one a thousand miles away. Towns mushroomed and



Rocky Mountains: index map

were deserted within a few years or even a few months.

As is frequently the case, the industry eventually settled down to less-dramatic, more-stable lode mining. Gold was largely replaced by silver, copper, lead, zinc, and, more recently, molybdenum. Out of thousands of ephemeral camps came semipermanent Leadville, Park City, Trail, Butte, and Coeur d'Alene. Rocky Mountain mining has suffered a decline in recent years that is more than a reflection of national economic conditions. Some are pessimistic regarding the future; others believe it is promising. It is possible that petroleum may be the basis of a new regional mineral boom.

Livestock ranching and agriculture are older than mining, but their development lagged in competition with the more-alluring search for gold. However, in time grazing became widespread, and remains a dominant form of land use where natural conditions preclude agriculture. Agriculture gained early prosperity when located in the vicinity of mining-camp markets. Today it is practiced on most arable lands by both dry-farming and irrigation methods. Distance to large markets and a crop range limited by climatic conditions would seem to indicate the desirability of complementary relationship between agriculture and grazing.

Lumbering is of primary commercial importance only in the Northern Rockies. In Idaho

and Montana the timber is of excellent quality and it is reasonably easy to log. Although the local sale is limited, excellent rail connections make available the Plains and Prairie markets once served by the Great Lakes forests. National forests include a majority of the timbered areas, thus assuring a regulated supply of lumber for the future.

The scenic beauties of the Rockies appealed even to the practical mountain men of the trapping era. Today the natural attractiveness of the region is appreciated as offering a monetary return equal to any other source. Rocky Mountain Park, Yellowstone, Glacier Park, Lake Louise, and other established parks are supplemented by new tourist enticements in the form of dude ranches and winter sports. Government-reserved, undeveloped primitive areas appeal to an increasing number who appreciate untouched nature.

The region's limited urbanization is localized by natural routes of travel and areas of intensified mining, lumbering, or agriculture. Railroads and highways are highly restricted as to choice of passes whereby they may cross the Rockies. Only three passes through the Canadian Rockies: Yellowhead, Kicking Horse, and Crowsnest, are used by railroads. Three lines cross the mountains in Montana and Idaho. Much the easiest route is



Rocky Mountain pasture (U. S. D. A. photograph)

followed by the Union Pacific through South Pass in the Wyoming Basin. The expensive Moffat Tunnel gives Denver direct rail connection with Salt Lake City. Another line surmounts stiff grades in crossing the southern Colorado Rockies. The railroads pioneered the way well, so that highways tend to parallel them closely. Location on a natural crossing of the mountains is by itself responsible for none of the major cities of the region. It has, however, aided growth where other factors are favorable.

The two major cities of the region are very different in character. *Butte* (0.037 million) is the largest, but lost population between 1930 and 1940. It is a great copper-mining center situated on two transcontinental railroads. The city prides itself on the preservation of many of the traditions of the old western mining camps.

Santa Fe (0.02) anchors the southern end of the region. Once significant as the western terminus of the Santa Fe Trail, the city lost out when left offside by the railroads. Modern highways have brought about a rejuvenation, adding to the old agricultural and grazing industries a profitable stream of tourists attracted by the pleasant climate

and the picturesque qualities of the old Spanish-American town.

It should be pointed out that many of the commercial and industrial urban functions for the Rockies are performed by cities lying just outside the region: Calgary, Denver, Salt Lake City, and Spokane, to mention four of the more important.

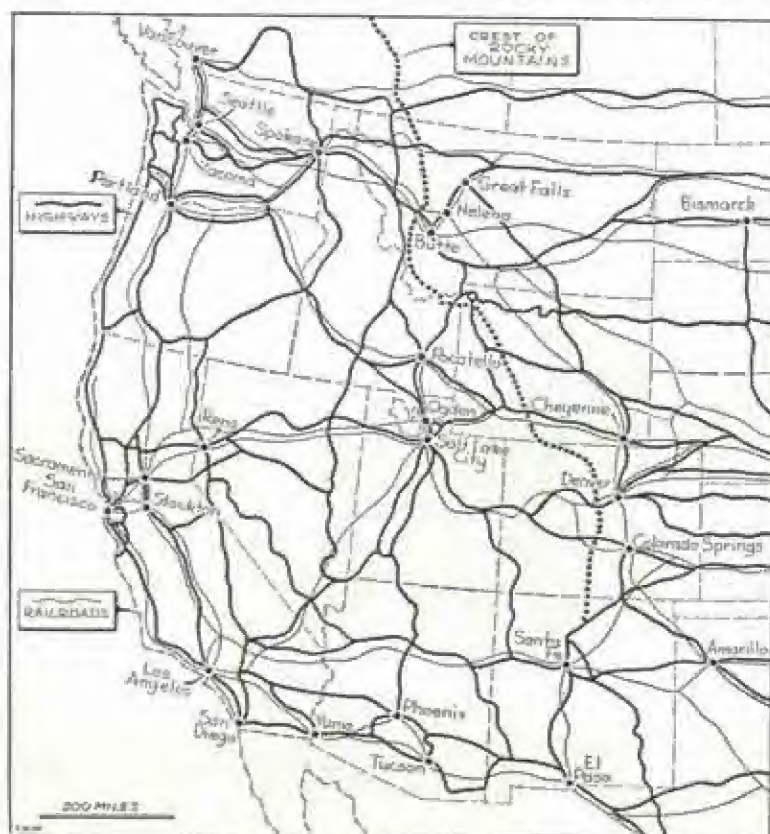
THE PLATEAUS

Lying between the Rockies and the Pacific Mountains is a series of well-defined physiographic areas: the Colorado Plateaus; the Basin and Range Province; the Columbia Plateaus; and the Interior Plateau of British Columbia. All of them can be squeezed into the broad definition of plateau; in detail they are distinct.

The Colorado Plateaus consist of a large number of rather flat surfaces of different elevation separated by steep escarpments. In part they are cut by deeply eroding rivers; the Grand Canyon of the Colorado is the outstanding example. The Basin and Range Province is composed of irregular ranks of parallel rocky ranges and wide intervening alluvial basins. The Columbia Plateaus are formed by a great thickness of lava flows that largely obscure a complicated older topography.

The surface is level to rolling and it is trenched by the canyons of major streams, notably the Snake and Columbia rivers. The Interior Plateau of British Columbia consists of a flat upland cut by long narrow valleys whose step-like walls are the indirect result of glaciation.

Climatically the region varies widely as to temperature; it is uniform in the scantiness of its precipitation. The Imperial Valley of California, and southern Arizona are subtropical; the northern plateaus have severe winters. Throughout most of the region the annual precipitation is less than twenty inches; in much of it, less than ten.



Western United States: routes

Precipitation effectivity, as expressed in natural vegetation, varies with temperature, and temperature, in turn, with elevation and latitude. Thus the bottom of the Grand Canyon has desert plants, while the plateau rim a mile above it supports an open pine forest. The ranges and higher surfaces of the northern plateaus are forested, while the lowlands are typically sagebrush covered. To the south higher areas are also forested, but at lower elevations sagebrush gives way to a plant complex whose most notable components are creosote bush and cactus.

The most striking feature of the occupance pattern is the spotty distribution of a sparse population. The explanation of this phenomenon is found in an equally uneven availability of water. For most of the region rainfall is far too slight for agriculture without irrigation. There are areas of sufficient forage that are ungrazed because of lack of water for livestock. Only mining shows a measure of independence of local water supply, since in some instances it can afford expensive importation.

Agriculture in the region has a respectable antiquity in the floodwater farming of the Pueblo Indians. The pioneer Anglo-American experiment was conducted by the Mormons, a people totally without background in irrigation agriculture. They brought water to the alluvial piedmont flanking the escarpment of the Wasatch Mountains, and created the economically sound Salt Lake oasis. The Mormons' successful venture encouraged similar attempts. Some succeeded; many failed for lack of experience or capital. Increasingly the national government undertook the sponsorship of irrigation projects, often at a cost so great as to preclude any return on the investment. Most recent among government projects are Hoover Dam on the Colorado River and Grand-Coulee Dam on the Columbia.

Irrigated areas comprise less than five per cent of the total area of the Plateaus, but they are scattered from Arizona to British Columbia. Common to all is an intensive cultivation. Crops vary with latitude, transportation to markets, seasonal opportunities, and a host of other factors. Illustrative of the range are apples in Washington, Oregon, and British Columbia; potatoes in Idaho; sugar beets in Utah; and cotton, lettuce, and cantaloupes in California and Arizona. With water a controlled element, agriculture is nearly as predictable as the output of a machine.

There is a large dry-farming area in Washington and Oregon. This subregion has long been a major wheat producer. Very different is the rural pattern from that of the oases. The individual wheat farms may reach several thousand acres.

The intensity of irrigation agriculture is missing. Annual variation in precipitation is a matter of concern. Where they are possible, irrigation projects are eating into the limited domain of dry farming.

The Spaniards introduced the grazing industry in New Mexico. They also gave the Navaho Indians sheep and horses to convert the aboriginal hunters and gatherers into thoroughgoing pastoralists. An overflow of Anglo-Americans from Texas extended cattle ranching through the plateaus of Arizona. Commercial grazing invaded Washington, Oregon, Idaho, and lesser areas elsewhere, following a pattern broadly similar to that of Great Plains ranching. As in the Great Plains, grazing has suffered from the inroads of agriculture and even more from the errors of its own ways. Overgrazing has resulted in serious erosion and the invasion of weed plants on lands that once provided excellent forage.

Today grazing remains the most widespread and least intensive use of the land. It involves cattle, sheep, and even goats. In particular it varies from the sixteen-million-acre open range



Plateaus: index map

of the Navaho shearers, through the traditional cattle ranches of the Colorado Plateaus, to isolated ranches hidden along the fronts of desert ranges in Nevada. Pastoralism seems assured a long life in this region of limited possibilities.

Early mineral discoveries came as an aftermath of the rush of forty-niners to California. Placer-gold finds extended from Oregon to Arizona. The great bonanza boom, however, followed the opening of rich silver deposits at Virginia City, Nevada, about 1860. Succeeding strikes of both silver and gold kept Nevada a stronghold of mining traditions through the early years of the twentieth century.

As is the normal sequence when maturity replaces adolescence, the mineral industry has largely settled down to the large-scale exploitation of lean ores. Although silver is still produced, copper is today by far the chief mineral. Arizona is the nation's prime source of copper, while Utah and Nevada are among the first four. Less important than their fame would indicate are salt from

Great Salt Lake and borax from Death Valley.

Only three of the region's cities, Salt Lake City, Spokane, and Phoenix, reach the hundred-thousand class. Among them they illustrate the major reasons for urbanization in the Plateaus.

Spokane (0.160) is the chief city of the so-called Inland Empire, comprising Oregon and Washington east of the Cascades and Idaho. Spokane is a focus of transportation routes, and also the commercial and industrial center of a hinterland that produces wheat, lumber, and minerals.

Salt Lake City (0.182; metropolitan, 0.245) is the chief commercial city for a large part of the middle Plateau and central Rocky Mountain regions. Within the city's immediate sphere are the Salt Lake agricultural oasis; copper mines; ore smelters; basic iron production; sugar refining; flour milling; and sheep and cattle ranges. Salt Lake City lies on the major routes to Zion Park, Bryce Canyon, and the north rim of the Grand Canyon.

Phoenix (0.105) is primarily the urban center for the productive Salt River oasis. It is also a major winter resort.

THE PACIFIC NORTHWEST

The Pacific Northwest is a mountainous strip having an average width of about a hundred miles and extending some twelve-hundred miles from northern California to the southern boundary of Alaska. Its eastern limit is the crest of the Cascades and the Coast Mountains of British Columbia, a barrier so effective as to permit the crossing of but two major streams, the Columbia and the Fraser. Rimming the seaward margin are the less-impressive Coast Ranges of the United States and the large islands flanking the British Columbia mainland. Between the two mountain systems is a belt of comparatively level land, the Willamette Valley in Oregon and the Puget Trough in Washington. The coast line from Puget Sound south to California is broken by only minor irregularities; north of Puget Sound the mainland is indented by innumerable fiords, and projects in mountainous headlands. The island barrier forms the protected "Inside Passage." (See page 542.)

It is a region of mild winters and cool summers, with a growing season remarkably long for its latitude. Rainfall is heavy, with a winter maximum that turns to snow in the mountains. Climate has nurtured a magnificent coniferous forest. Redwood is the dominant commercial species in coastal California; Douglas fir in Oregon and northward, until it gives way to spruce and hemlock in central British Columbia. Abundant



Oregon coast (U. S. Forest Service photograph)

precipitation, open winters, and steep slopes combine to give the region an unexcelled water-power potential. The innumerable clearwater streams are the natural spawning grounds of salmon, while marine fisheries yield halibut, herring, shellfish, and other commercially important varieties. One respect in which nature is apparently niggardly is the lack of known mineral resources of importance. The minor coal deposits of Puget Sound and Vancouver Island are the best of a poor lot.

Culturally the Pacific Northwest is distinctive by reason of its isolation and its preoccupation with lumbering and fishing. It has well-defined population nuclei centered about Portland, Seattle, and Vancouver. Its limited agriculture is specialized. Industrialization is crystallized largely around advantages inherent in the region.

Agriculture was the first occupation of settlers who came in the early 1840's to support American claims to the disputed Oregon country. Patriotic New Englanders were the vanguard of a migration that followed the Oregon Trail to the Willamette Valley. The semiopen Valley was the one place where farming could get underway immediately and easily. So great was the influx of settlers that by 1846 the British were glad to accept the present international boundary, and the Valley was sending an overflow of immigrants to California. Agriculture became unexpectedly prosperous when the California gold rush opened a rich market.

Commercial lumbering began almost with the earliest settlers, and the first of a still-unbroken flow of exports to California, the Hawaiian Islands, and Australia was soon underway. Attempts to preserve salmon for shipping to distant markets were successful in the middle 1860's. Thus the plan of development was early outlined; it is reminiscent of the New England that supplied the first settlers for the new land on the Pacific.

Agriculture has expanded beyond the Willamette Valley to coastal embayments, mountain valleys, and the periphery of Puget Sound, yet it utilizes less than five per cent of the regional area. Deficiencies in the form of limited level land, expensive clearing of forest, and distance to markets are not easily overcome. Dairying is replacing still-dominant grains and pasturage; the cheeses are becoming widely known for their excellence. Deciduous fruits, berries, and vegetables are well adapted to natural conditions. Specialties such as hops and bulbous flowers have a national market.

Lumbering reached its majority during the first quarter of the present century, when the Pacific Northwest became the continent's prime producer. Logging and sawmilling are today highly mech-

anized industries whose resemblance to earlier operations in the East is slight. The market is both national and international. Since the region contains Anglo-America's last major stand of virgin forest, present rapid depletion is a matter for widespread concern.

The region's basic industries are those processing or manufacturing the product of forest, fishery, and farm. The building of ships and airplanes and related war-boomed industries will most certainly decline. The region has advantages for large-scale general manufacturing in a favorable climate and an abundance of hydroelectric power. On the deficit side are a limited range of local raw materials and distance to the big markets, handicaps that must be overcome if the scope of industrialization is to be enlarged.

The Pacific Northwest has three large cities. Each is a port and each shares the general background of lumbering and fishing. Additionally, each exhibits local specialization and has its distinctive extraregional relations.

Vancouver (0.275 million) is the third-largest Canadian city. It is the terminus of transcontinental railroads and of steamship lines to Alaska and Asia. Near Vancouver are the important coastal coal mines.

Seattle (0.463; metropolitan, 0.603) is the center of Puget Sound urbanization. Seattle's growth to the largest city of the region was initiated by the Alaska mining developments around the turn of the century. Trade with the Orient is also important. Among the more important industries are airplane manufacturing and shipbuilding in Seattle and ore smelting in Tacoma.

Portland (0.371; metropolitan, 0.534) has great advantages of natural location, since it controls the outlet of the Willamette Valley, and the Columbia gorge, the easiest route through the Cascade Mountains. In addition to Portland's expected importance as a commercial and transportation center, it has shipyards, an aluminum smelter, and an old wool-manufacturing industry.

CALIFORNIA

California as a geographical region is something less than the political division. Excluded are the Coast Ranges north of San Francisco, which are part of the Pacific Northwest; the dry country east of the Sierra Nevada belongs to the Plateaus. Remaining to the region are four well-defined units: the Sierra Nevada; the Valley; the Coast Ranges; and Southern California.

The Sierra Nevada is the region's impressive eastern wall. It is in effect a 400-mile-long tilted block whose steep face is toward the east. In the south many peaks of the High Sierra rise above 12,000 feet. Mt. Whitney, highest peak in the United States, attains 14,496 feet. The northern portion is famous as containing the Mother Lode, source of the gold that brought on the rush of 1849. The western slope is well timbered between 1,500 and 9,000 feet. Deep winter snows feed perennial streams that flow westward to the Valley.

The Valley is a fifty-mile-wide depression lying between the Sierra Nevada and the Coast Ranges. Its two ends are drained by the Sacramento and San Joaquin rivers, which join about midway to discharge westward into San Francisco Bay. The Valley is low and seemingly flat, and in general has productive alluvial soils. Summers are very hot and winters are mild. Rainfall is so slight as to qualify a portion of the Valley as desert.

The Coast Ranges are composed of a number of low parallel ridges and valleys, a pattern reflecting the crustal instability that gives rise to frequent earthquakes. Winters are mild and summers cool to warm, depending upon location. Moderate to low winter rainfall favors scrubby chaparral over true forest growth.



California: index map

Southern California is a term devised to cover the coastal area south of Santa Barbara. In large part it is set off by mountains from the remainder of California. Climatically it is Mediterranean verging on steppe, with length of growing season and frost risk such as to qualify as subtropical. Eulogies to California climate generally have this section in mind.

Neither the natural attractions of California nor its Indian inhabitants were sufficient cause for Spanish settlement. The establishment of a series of missions during the latter eighteenth century was a response to the appearance of Russian fur posts on the north Pacific coast.

The line of missions and the roads connecting them followed Coast Range valleys from Southern California to San Francisco Bay. The Spaniards and their Mexican successors were never numerous and they hardly got outside Southern California and the Coast Ranges. However, they introduced range grazing of cattle and sheep and they established Mediterranean agriculture.

The gold rush brought a great influx of Anglo-Americans to the Mother Lode and the northern Valley. San Francisco became an enterprising, bustling city; Los Angeles remained a sleepy Spanish-American town. From their settlement nucleus Anglo-Americans pushed southward in the Valley to raise wheat and graze cattle.

There was little change in the pattern of developments until the last quarter of the nineteenth century. Then improved rail connections with the East brought a new flood of settlers, particularly to Southern California, and made practicable profound alterations in agriculture.

Large-scale irrigation was applied to the Valley, Southern California, and Coast Range valleys. Grazing retreated to rough or non-irrigable lands, and the acreage of dry-farm wheat was sharply reduced. Citrus and deciduous fruits, nuts, grapes, and vegetables found receptive eastern markets. Dairying expanded. Even cotton and sugar beets added to the variety of crops.

About the beginning of the present century came another milestone in economic development, the discovery of petroleum. The southern part of the Valley and Southern California combine to rank second only to Texas in petroleum production. The use of petroleum as ship fuel halted the importation of bunker coal from Utah. Natural gas largely nullified the previous lack of mineral fuels.

Industry has a substantial backlog in handling and processing the products of farm, ranch, oil field, forest, and fishery. Another industry drawing directly on the region's resources or character is tourism. There seems to be no limit to those

who at all seasons find attraction not only in California's natural attributes but equally in an exhilarating mode of life that rightly or wrongly has come to be associated in the popular mind with California. The moving-picture industry developed in Southern California because of climatic advantages. Although these advantages are largely dissipated by the use of enclosed stages, there is certainly no marked tendency for the industry to move out of the region. Automobile assembly plants and tire factories are a sound response to sectional demand for their products.

Industrialization and manufacturing in direct competition with older eastern districts are a different matter. California has natural gas and hydroelectric power but is deficient in coal and iron ore. Furthermore, it is distant from the largest markets. In the manufacture of airplanes, which demands much skilled labor and a minimum of bulky, heavy parts, it appears that Los Angeles may retain the leadership it gained in war-time production. In spite of present efforts, it seems likely that the basic production of iron and steel and their fabrication into heavy machines and equipment will remain centered in the Central Manufacturing region, even to the extent of supplying the bulk of west-coast needs.

Urbanization is concentrated in two districts, and centered about two cities, San Francisco and Los Angeles. The two cities differ in appearance, tradition, and composition of population. They are rivals for trade and industry.

San Francisco (0.760; metropolitan, 1.990), situated on a hilly peninsula, is the chief unit of conurbation on magnificent San Francisco Bay. It is a major Pacific port and airline terminus located at the natural outlet of the Valley. San Francisco is a cosmopolitan city of old traditions. Its varied industrial interests include oil refineries, shipyards, automobile assembly plant, and steel fabrication plants. The presence of leading institutions of education make the Bay district pre-eminent in this respect for the entire Pacific coast. Included in the urban district are Oakland and Berkeley.

Los Angeles (1.954; metropolitan, 3.917) is located on a sloping plain between mountains and sea. Its artificial harbor has become an im-

portant and busy port. Water, electrical power, and natural gas are brought from great distances to supply domestic and industrial needs. Modern expansion and the enormous influx of Anglo-Americans obscure the traditional Spanish-American city and ways; there is, however, a large recent Mexican immigration. The rapid rate of growth of the area threatens to completely urbanize Southern California. Among the major items of industrial activity are: handling the products of Mediterranean agriculture; moving pictures and radio programs; clothing and fashions; tourists; oil fields and refineries; tires; and airplanes. The area becomes increasingly important for its institutions and personalities in the fields of science, art, literature, and education.

ADDENDA

If regional divisions which profess to be primarily cultural conform in part with natural regions, it is due in some measure to the retention of terms established by usage. But, more important, there persists in much of Anglo-America a pioneer relationship between man and the obvious resources that have value in his particular culture scheme.

In regions occupied longest or most intensely utilized, changes have been profound. In the wake of the retreating frontier, fur country has become in turn timberland and farm land, Hunting has given way to grazing, grazing to wheat, wheat to corn, and corn to dairying. Inherently good land has in some cases been destroyed and returned to forest; in others, poor land has been made highly productive.

In a few spots the observer gets a sense of cultural maturity, of agriculture that does not destroy the source of its being, of industry independent of its immediate environment, secure in the wisdom of its proprietors and the skill of its workmen.

But temporary or permanent, the Old World base of Anglo-American culture has yielded to borrowing, invention, and elaboration to develop new species of the culture genus, *Europa*.

56: Northern Latin America

Latin America begins at the Rio Grande. It includes Mexico and the countries of Central America, South America, and the West Indies. Most of the countries are independent republics; several in the Caribbean area are remnants of once-extensive European empires.

Although European settlements in Latin America antedate those in Anglo-America by a hundred years, a pioneer stage of development is much more evident in the former. Conflicting claims to largely unoccupied lands become acute with a flaring of national pride or the discovery of a valuable mineral. Territorial conflicts emphasize the pioneer pattern of clustered population. That

is, nuclei of relatively high population density are separated by areas of low density. The nuclei are largely confined to distinct political units. In part they are the outgrowth of the original settlements, in part of more recent development. The unusual and significant point in the present connection is that political units are frequently cultural units. The situation is unlike that in Anglo-America, where the political boundary between the United States and Canada rarely has marked cultural significance.

Therefore, in this section on Latin America the regions are political divisions. Since it is impossible to discuss each country in detail, they are grouped in the following manner: Mexico, Central America, the West Indies, Northern South America, Central South America, Southern South America, and Brazil.

MEXICO

In broad plan Mexico serves as a type for much of Latin America, particularly as contrasted with Anglo-America. It illustrates clustering of population; a great city, large for its hinterland; the importance of subsistence agriculture and the extractive industries; the coarse network of railways and automobile highways; and the minor extent of modern industrialization. Mexico exhibits the importance of Indian blood; the dominance of the rural



Latin America: political map

village over isolated farmstead; the outward expression of religion in overshadowing edifices; and the hiatus between landed gentry and impoverished peon.

Mexico has an area of approximately 760,000 square miles, about a quarter that of the United States. Its population is some 26 millions, dominantly Indian in race, although only about a third are fullbloods. The rate of increase is slow because a high death rate offsets a high birth rate. Population is notably concentrated in the Valley of Mexico and adjacent plateau basins. The center of the cluster is *Mexico City* (3.00 million), which places it slightly ahead of Buenos Aires as the leading city of Latin America. A corridor of dense population extends from the nucleus to Veracruz, Mexico's principal port, on the Caribbean. Mountains interrupt a lesser corridor reaching to Manzanillo, the country's major Pacific port. There are scattered minor population nuclei, but a minimum density is reached along the desert boundary with the United States, and in interior Yucatan and highland Chiapas, the southernmost Mexican states. Thus the population is concentrated in the territorial heart of the nation on a plateau having cool highland climates with limited precipitation.

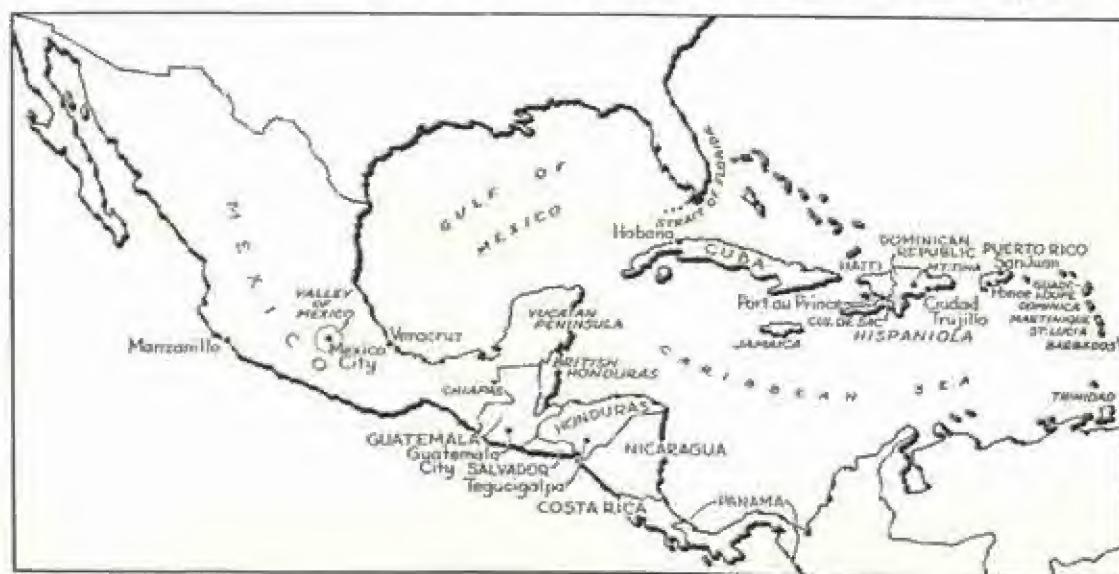
Mexico is basically an agricultural country, despite a dominance of steep slopes. Maize or Indian corn is the common crop, though temperature ranges from *tierra caliente* to *tierra fria*, and precipitation from southeastern rain forest to northwestern desert. The demand for arable land

is ever present, and the shortage becomes more acute in view of almost unbelievable soil wastage.

The patterns of rural occupancy are a mixture of Indian and European. Representative of the former are the communal holdings, where small plots about the villages produce crops of corn, beans, peppers, and tomatoes. More European are the *ranchos*, several acres cultivated by the owner-laborer, who comes daily from the village to raise largely the same subsistence crops as the Indian. Largest in order of magnitude and areally dominant are the *haciendas*, each of several thousand acres. The hacienda has its own village or villages where live the peasant-laborers who raise both subsistence and commercial crops. The large landholdings produce maguey for pulque, cotton, tobacco, sugar cane, sisal hemp, coffee, bananas, and cattle. Of these items only sisal, coffee, and bananas are important as exports to foreign markets.

Despite the areal dominance of agriculture, minerals furnish the bulk of exports and preserve a favorable balance of trade. Mexico is true to tradition in remaining a prime producer of silver, about forty per cent of the world's output. Other important minerals are gold, copper, lead, zinc, mercury, and petroleum. Until recent years nearly all the mines and oil wells were foreign owned, and so of limited benefit to Mexicans. Expropriation of the oil wells, however, failed to improve the situation, since Mexico could not supply technicians to replace the ousted foreigners, and production declined rapidly.

Mexico, like other Latin-American countries, is an exporter of raw materials and an importer of



Middle America: index map

manufactured goods. Even the ore smelters and oil refineries process raw materials for export. There is a long history of small, localized industries, such as the making of saddles and other leather goods, cotton textiles, coarse clothing, sandals, pulque, and tequila. Within recent decades there has been an acceleration of industrialization within the area of concentrated population. In the main it is a process of centralizing, modernizing, and intensifying old light industries to produce textiles, clothing, shoes, beverages, foodstuffs, and cigarettes. It utilizes Mexican labor and raw materials, and caters to the Mexican market. Of quite different character are the furnaces at Monterrey which use Mexican coal and iron ore to supply iron and steel to foundries and machine shops in the city.

Industrialization has but speeded a trend toward urbanization that is common to all Latin America, despite the dominance of agricultural pursuits. City growth means modernization and the eradication of the picturesquely old. It widens the gap between city and the little-changed village of the agricultural Indian.

CENTRAL AMERICA

Six independent countries; Guatemala, Honduras, Salvador, Nicaragua, Costa Rica, and Panama; and a British possession, British Honduras, occupy the narrowing body of land that lies between Mexico and South America. The combined area is about 230,000 square miles, or somewhat less than Texas. Guatemala is the largest country, with its 45,000 square miles the equivalent of Pennsylvania. Aside from British Honduras (8,900), Salvador is the smallest; 13,200 square miles make it the same size as combined Maryland and Delaware.

The total population of Central America is about 10 million, ranging from the 2.9 million of Guatemala to Panama's 805,000, again excepting British Honduras and its 65,000. The average regional density is 44 per square mile, but the figure is of limited significance in view of a marked clustering of population. For each country there is a nucleus of comparatively dense rural population surrounding the capital city; there is also a much larger back country of very low density. An exception is Salvador, where virtually the whole country is occupied with but moderate departure from an average density of nearly 165 per square mile.

The clustering of population is due to both natural conditions and historical factors. Pertinent natural conditions are interrelated matters of elevation, climate, and soils. The dominant surface

feature of Central America is the plateau. Its western margins are deeply mantled with lava and ash, irregularly enough to produce numerous basins or valleys that are floored by productive soils and surmounted by volcanoes. The plateau is generally high enough to fall within the temperature range of *tierra templada* and *tierra fria*. Rainfall varies in amount with exposure, but it is normally sufficient without being excessive and it comes during the summer months. Less in areal extent is the coastal plain bordering the Caribbean. Its low elevation is accompanied by a tropical temperature regime; its windward exposure and highland backing account for heavy precipitation and rain forest vegetation. The still-narrower Pacific coastal plain is also *tierra caliente*, and in part it gets sufficient rainfall to support a heavy forest.

The Spaniards approached Central America from their major bases in Panama and Mexico. They neglected the hot, fever-ridden Caribbean coastal plain, but they scoured the plateau for minerals. Largely unsuccessful in the search for ready wealth, the handful of Spaniards who remained turned to the one alternative, land and Indian labor to work it. Seeking and sometimes finding the right combination of land and labor helped greatly to establish the nuclear settlements of subsequent nationhood.

The Spaniards founded *Guatemala City* early in the sixteenth century, on the western margin of the plateau. Here was a dense population of agricultural Indians who provided labor for the settlers' large estates. Prospectors from Guatemala established *Tegucigalpa* at the site of silver finds. Even though the mines proved mediocre and Indians were few, the area became an agricultural nucleus. Salvador lacked both Indians and mines. It was a minor agricultural nucleus that isolation and chance made significant.

Nicaragua is distinctive in that original settlements were made in the tropical lowland that crosses the country. High hopes of securing mineral wealth brought settlement in 1524. A relatively abundant Indian population localized the major agricultural development around Granada. Costa Rica too is a special case. Large estates could not operate in the absence of Indian labor. Here in the moderate climate of the plateau, Spaniards became small farmers who did their own work. Panama is unique in that its population cluster is fixed by the crossing of the isthmus.

The prosperity of commercial agriculture depended upon producing a cash crop cheaply. Cacao, wheat, indigo, sugar cane, and cattle were

all tried with varying degrees of success. Times were good and poor, more the latter than the former. Only in the middle of the nineteenth century did a single crop, coffee, come to dominate commercial agriculture and bring it a measure of assured prosperity. The quality of the bean produced on the plateau is rated high on the world market. Improved transportation made competition with other regions possible. Coffee became promptly the chief item of export of nearly every Central American country, and demand was sufficient to justify expansion of plantings.

The rise of coffee left the tropical coast what it had been, an area of little utilization and few people. Not until the closing decades of the nineteenth century did an awakening come with the establishment of banana plantations. Promoted by large United States corporations, the new industry spread along the Caribbean coast from Panama to Guatemala. The forest was cleared for plantations; sleepy ports were awakened and modernized; railroads were built; and, more important, Negro laborers imported from the West Indies remained to multiply and become the dominant racial group in the Caribbean lowland.

Coffee and bananas remain the leading cash

crops and provide such economic stability as Central America experiences. On the plateau coffee is king, whether it is produced by peasant farmers in Costa Rica or by Indian laborers on the plantations of Guatemala. In Salvador medium-size farms push up the very sides of the volcanoes. Balsam in Salvador, Nicaragua's gold, and cattle, sugar cane, and cotton elsewhere are but minor hedges against possible disaster to the one-crop economy.

Banana production has faced disaster in the form of plant disease. Large sections of the Caribbean coast have had to be abandoned. There is an increasing movement of the industry to the disease-free Pacific coast—without taking the Negro laborers along. The east coast shows modest activity in timber cutting, chicle gathering, an expansion of subsistence agriculture, and the production of cacao.

The marked changes in agriculture and the growth of population have not destroyed the old nuclear pattern of settlement nor have they altered the racial composition of the plateau. Guatemala is overwhelmingly an Indian country. The plantations and ranches of Europeans are more than matched by Indian villages where the inhabitants support themselves by subsistence maize agriculture, retain their ancient markets, and play no part in the modern world of commerce. Honduras, Salvador, and Nicaragua, where there never were many Indians, are predominantly *mestizo*, hence European rather than Indian in culture. Highland Costa Rica is populated by the descendants of the Spaniards who had no Indian labor, so is almost entirely European in blood. Panama remains what it has long been, a significant crossroads; it has the racial heterogeneity inherent in such a situation.

Commercially, Central America is an exporter of raw materials and an importer of manufactured goods. Industrialization is not even incipient. But faintly represented in the scene are the attributes of the mechanical age such as railroads, modern highways, and great power projects. Curiously but quite naturally, the airplane, as in other technically retarded regions, plays proportionally a much greater part in transportation than it does in the most modernized lands.

Despite primary dependence upon agriculture and the great extent of unoccupied lands, the degree of urbanization is high in Central America. This is notably true in Panama and Nicaragua. But in this respect Central America shows no departure from the pattern characteristic of the New World as a whole, where the disproportionate growth of cities cannot be explained entirely by economic developments.



Coffee harvest (U. S. D. A. Agricultural Relations photograph)

THE WEST INDIES

The West Indian islands form a great capital "L," so placed as to set off the Caribbean Sea and partially block the opening to the Gulf of Mexico. The longer leg of the "L" trends roughly east and west and is composed of the larger islands, the Greater Antilles. The shorter leg is arcuate in form and has a general north-south orientation. The smaller islands composing this leg are collectively the Lesser Antilles.

The four large islands of the Greater Antilles, together with their areas and approximate size equivalents among the states are: Cuba, 44,164 square miles (Pennsylvania); Hispaniola, divided into the Dominican Republic, 19,332 square miles (West Virginia), and Haiti, 10,204 square miles (Maryland); Jamaica, 4,450 square miles (Connecticut); and Puerto Rico, 3,435 square miles (Delaware).

The Lesser Antilles range in size from Trinidad, 1,864 square miles (equal to Rhode Island), to tiny coral reefs. The larger islands are divided in ownership between France and Britain. To the former belong Guadeloupe and Martinique; to the latter, Dominica, St. Lucia, Barbados, and Trinidad.

The Greater Antilles, as described in a previous section, are components of a major structural feature that extends to the Central American mainland. The islands are rough and broken, although not excessively high, since the outstanding peak, Mt. Tina in the Dominican Republic, reaches slightly over 10,000 feet. Cuba is an exception in the possession of extensive plains of the character and origin of similar features in Yucatan, Florida, and the Bahamas. The Lesser Antilles are the product of vulcanism, embellished by coral growth. Again there is an exception. Trinidad, structurally part of the South American continent.

Climatically the whole West Indian group is tropical. Temperatures are reduced by elevation and tempered by the presence of the sea. Precipitation varies as to amount and season. Steep, unobstructed, northeast exposures get an abundance of rainfall without marked dry season. Flat lands and leeward positions have summer dominance of a smaller total. In southern Haiti the protected Cul de Sac is actually semiarid.

The West Indies are culturally a distinct region since they possess a unique combination of common and unusual cultural attributes. They are politically colonies, or, with one exception, their freedom has come recently. They have long been a bulwark of tropical plantation agriculture. They are racially Negro more than Caucasian, and

Haitian culture is more African than European. Tongues other than Spanish are native to large groups. Rural population densities in several spots reach the maximum for Latin America.

The islands were the seat of earliest European settlement in the Americas, but after a thorough search revealed little mineral wealth, the greater attractions of Mexico and Peru drew most of the Spaniards to the mainland. The West Indies were relegated to minor importance as outposts of empire; Habana, for example, was a fort to protect the treasure fleets sailing for Spain through the Strait of Florida. Unoccupied islands were excellent bases of operation for pirates who attacked the fleets and raided settlements. There was some production of food and commercial crops by Spanish settlers on the island coasts, but the island interiors, such as they were used, were divided into large estates for grazing. Since the Indians were virtually exterminated within fifty years after Columbus' arrival, labor needs were satisfied by the importation of Negro slaves.

The islands experienced a new and greater importance with the expansion of commercial sugar cane culture. The great success of the Portuguese in Brazil caused a spread of sugar production into the West Indies. It reached the Lesser Antilles first. By the middle of the seventeenth century they were being intensively cultivated, with a well-established system of large estates, few Europeans, and many Negro slaves.

The wave of sugar prosperity reached the Greater Antilles in the eighteenth century. The western, French portion of Hispaniola, subsequently Haiti, was long the leading producer. British Jamaica ranked second, and took over first place when slave revolts threatened and finally drove both the French and sugar production out of Hispaniola during the latter part of the eighteenth century. Spanish-held Cuba, Puerto Rico, and eastern Hispaniola lagged far behind. Major Spanish interests were still centered elsewhere, and little was done to aid sugar production on their island possessions.

The nineteenth century witnessed a decline of sugar prosperity in the West Indies. Beet-sugar competition and the abolition of slavery so reduced profits as to invite trying a greater variety of crops. The growing of sugar cane remained widespread, and so did its conversion into marketable rum. But coffee, cacao, coconuts, tobacco, cattle, sisal hemp, bananas, timber, and even cotton reached greater relative commercial importance than they had held before.

Sugar was destined to experience at least one

more boom. This has been largely a matter of the twentieth century and Cuba has been its center. The new spurt in production came with Cuba's independence gained in 1898. Cuban sugar production was financed by United States capital and fortified by preferential access to the American market. From a nuclear area in the vicinity of Habana, cane cultivation continues to expand in eastern Cuba, leaving declining yields in its wake. Puerto Rico's sugar acreage has similarly expanded due to tariff protection.

The West Indian islands differ enough among themselves culturally to make it difficult to generalize regarding them. In the following paragraphs are pertinent facts regarding each of the four major islands.

CUBA Sugar production is overwhelmingly Cuba's major economic pursuit, although it is matched in areal extent by the combination of grazing and forage crops. Striking is the pattern of the big sugar *central*, with its village cluster of refinery, dwellings, stores, school, and church, surrounded by almost limitless fields of cane. Of lesser importance are tobacco, bananas, citrus fruits, and vegetables. There is still importation of foodstuffs. Chromium, manganese, and iron ores are exported to the United States.

Cuba's population of over 5.47 millions represents a high rate of increase since 1898, but leaves the average per mile density (121) far less than that of two southern neighbors, Haiti (294) and Jamaica (323). Negro laborers from the latter countries work in Cuba's sugar industry, but are promptly sent home at the conclusion of seasonal activities, not only for economic reasons but also to preserve the Negro-Caucasian proportion in Cuba's population.

Habana (800,000 inhabitants) is the largest port city in the entire Gulf-Caribbean region, and is an attractive, modern city that receives many United States winter tourists. It is the focus of Cuba's 4,000-mile railroad system, as well as the political and commercial center of the country. The manufacture of tobacco products, once a significant industry, is less important than before United States placed restrictions on imports. Although Habana is by far the largest Cuban city, there are others of sufficient size to make the country's population approximately a quarter urban.

HAITI is a densely populated Negro country. The rural occupance pattern is strongly reminiscent of West Africa. Irregularly oriented thatched houses compose the village about which are patchy

fields producing subsistence crops such as cassava, yams, plantains, sugar cane, and maize. The hoe is the principal agricultural tool. Periodic markets follow African custom. An older French pattern of utilization is almost obliterated. Only the capital, *Port-au-Prince*, retains a decided French character.

Coffee and cotton, harvested largely from wild trees and plants, are the leading exports. Growing production of sugar, sisal hemp, bananas, and cacao for world markets is due in large part to American enterprise and capital.

The tremendous increase in population has been in the main rural, so that *Port-au-Prince*, Haiti's principal city, still has less than 130,000 inhabitants.

THE DOMINICAN REPUBLIC presents quite a different picture. While the country is dominantly mulatto in racial composition, perhaps a quarter of the population is Caucasian or near-Caucasian. The language is Spanish rather than the French of Haiti, and the culture is Latin American rather than African. More significant is the matter of population density, 124 per square mile as compared with Haiti's 294. Dominican fear of the more-numerous Haitians led to a massacre of some 10,000 of the latter in 1937, and has made the Dominican Republic receptive to European immigration.

Northern and southern lowlands are most densely populated and produce the bulk of the export crops: sugar cane, cacao, tobacco, and maize. The highlands yield coffee and gold. Areal most extensive is grazing, which employs a sparse population.

The capital and principal city is *Ciudad Trujillo* (formerly Santo Domingo), now in the 150,000-population class. The city is interesting because of a few old buildings that have survived earthquake and hurricane, and its associations with Columbus.

JAMAICA All but a few thousands of Jamaica's 1.37 million inhabitants are Negroes. The average density of 323 per square mile is such as to send Jamaican Negroes as both temporary laborers and permanent inhabitants to the whole periphery of the Caribbean.

The land is so rough and the precipitation so variable that cattle grazing is the dominant form of utilization. Densely inhabited parts of the interior are given over to subsistence farming and small-scale production of bananas. This crop is added to that from the larger coastal banana plantations to comprise Jamaica's major export. The older plantation production of sugar remains important only in restricted areas.

PUERTO RICO differs in some noteworthy respects from other Antillean countries. Its over 2-million inhabitants give it the highest average density, 600 per square mile. It is more completely devoted to plantation agriculture than is any other of the West Indies, and is the most thoroughly modernized. The fast-growing population of the island is increasingly more Caucasian than Negro.

As a Spanish colony Puerto Rico gained a modest prosperity from sugar cane and coffee. Grazing was areally the most extensive occupation. There was a striking contrast between large slave-worked plantations and the small subsistence farms of white peasants. Prior to its ceding to the United States in 1898, Puerto Rico suffered the neglect and poverty common to the Spanish colonies of the day.

The entry of the United States was the signal for the expansion of plantation agriculture, the modernizing of the country, and a tremendous growth of population. Plantation agriculture grew to the point where many foodstuffs have to be imported. Sugar and related products are overwhelmingly dominant in the country's economy. Tobacco, citrus fruits, coconuts, and coffee are of lesser importance.

Growth of population has largely negated the benefits of modernization. The general welfare of the mass of people is little better than it was during the Spanish regime. The population is still essentially rural. *San Juan* (0.225 million) and *Rio Piedras* (0.132 million) are two of the cities that make the country about one-third urban.

NORTHERN SOUTH AMERICA

Colombia, 448,000 square miles; Venezuela, 352,000; and Ecuador, 296,000, comprise the Greater Colombia formed by Simon Bolivar 130 years ago. Together the area of the three countries is about a third that of the United States. Colombia has much the largest population, with its 11.260 millions, followed by Venezuela with 4.99, and Ecuador, 3.077. Their combined total is about one-eighth the population of the United States, with a rather meaningless average density of 22 per square mile, as compared with 50 for the United States.

Topographically each country is in part Andean, with the climatic modifications accompanying elevation. Each has a strip of tropical coast, varying with exposure from rain forest through savanna to steppe. Each has interior tropical lowlands, also varying as to precipitation. All three yield petroleum and give promise of expanded production.

The racial elements represented in each country are the same, but the proportions are different.

Venezuela and Colombia are predominantly mestizo; Ecuador is as strongly Indian. Negroes are an important element in each country. Persons of unmixed European origin are proportionally of small number. Population clusters leave much of the national domain effectively unoccupied. The existence of isolated population nuclei does much to explain why Bolivar's plan for a united Greater Colombia would not work.

The Spanish approach to the region was naturally from the Caribbean. On the Venezuelan coast, Cumana was founded in 1523, Coro in 1527. From the latter point explorers entered Lake Maracaibo. There they were inspired by pile-dwelling Indian villages to name the country Little Venice or Venezuela. Inland movement discovered placer gold and resulted in the founding of Caracas in 1767. Ten years later Caracas was made the administrative center of the district.

Santa Marta in 1527 and Cartagena in 1533 were established near the mouth of the Magdalena River in Colombia. The customary search for gold drew the Spaniards inland. In central Colombia they found a comparatively advanced metallurgy among Chibcha Indians. In the highlands east of the Magdalena they encountered a dense agricultural population of the same Chibcha linguistic stock. Among the latter they founded Bogota in 1538.

In Ecuador highland Quito had become the capital of the northern part of the divided Inca empire just prior to its conquest by Pizarro. Shortly after Quito's seizure in 1534, it became the seat of a Spanish presidency and an important city despite the local absence of valuable minerals.

Thus the three major nuclei were established. In 1718 Bogota was made the administrative center for a Spanish "Greater Colombia." The concept was revived by Bolivar and was in effect for ten years until 1831, when the three old cities of Caracas, Bogota, and Quito became the capitals of independent countries.

The search for precious metals never ceased, but the results were insufficient basis for an exclusive economy of mining. The division of desirable lands among worthy Spaniards began almost with the first settlements. Cattle were introduced to the hitherto unused high pastures of the Andes and the savanna llanos of Venezuela. Native maize remained the most widespread subsistence crop, somewhat augmented by wheat and other European food plants.

Commercial agriculture experimented with native crops such as cacao, tobacco, and indigo. Sugar cane appeared from the east and became

firmly established. Coffee was first planted in Venezuela in the latter part of the eighteenth century, but its major commercial importance came later.

The handicap of distance curtailed the production of cash crops in the remoter highlands. There the originally denser Indian populations retained their racial dominance and preserved their culture in moderately modified form. In the more accessible lowlands devoted to the production of sugar cane, cacao, and other plantation crops, the sparse Indian population was soon exterminated or it was absorbed by imported Negro slaves. The racial distinction between humid lowlands and remoter highlands is retained to the present.

The persistence of the oldest European interest in the region, mineral wealth, is responsible for the latest significant economic development. Colombia has experienced a marked revival of mining, but it is unimportant as compared with the far-reaching effects of petroleum production in Venezuela. For the last quarter century Venezuela has been a major world producer. Individual and collective interests have so centered on the petroleum industry as to blight virtually every phase of agriculture.

Old distinctions among the areas constituting the region have been reinforced subsequently by divergent developments. The following paragraphs seek to delineate the present scene in terms of the three political entities: Colombia, Venezuela, and Ecuador.

COLOMBIA Of Colombia's natural elements, coastal plain, mountains, and transmontane plains and highlands, the mountains contain the principal population clusters. To them must be added the considerable densities encountered in the combined delta of the Cauca and Magdalena rivers, the streams separating the three chains of the Andean system.

Colombia's leading exports: coffee, bananas, cacao, and hides; and gold, platinum, emeralds, and petroleum, are a key to the nation's commercial activities. The fact that about seventy-five per cent of the gainfully employed are engaged in agriculture establishes its importance relative to industry. The dominance of maize as a food crop is some indication of the considerable population who are subsistence farmers.

A brief sketch of each of four major cities and the developments of which they are the centers will serve to localize Colombia's varied activities.

Bogota (0.642 million), the capital and largest city, lies in a high valley of the eastern Andean range. It could be reached only by uncertain river transport on the Magdalena or combination of rail

and road from the Pacific until the establishment of airplane service about 1920. Bogota is a cultural center for much of northern South America, but its commercial importance is limited. Beyond the immediate environs the countryside is occupied largely by a dense population of Indian subsistence farmers. The near or distant hinterland produces emeralds, petroleum, coffee, and hides.

Medellin (0.355) is situated in a basin of the central Andean range. The area is remote from the coast and without special natural advantage. Despite this, the dense and expanding population of pure Caucasian stock is noted for its agricultural and commercial progress. Coffee is produced on small farms worked by the owners. Manufacturing, principally of cotton textiles, is easily the most highly developed of the nation.

Call (0.100) is the center of a population cluster in the upper Cauca Valley. Sugar cane is the chief crop, produced on large plantations by Negro labor. The city is a gathering point for cattle sent by rail to the Pacific port of Buenaventura.

Barranquilla (0.279) is the principal city of a cluster of three situated near the mouth of the Magdalena River. Barranquilla is both a sea and river port commanding traffic up and down the Magdalena Valley. In the vicinity sugar cane, cotton, and bananas are raised on both large plantations and small tracts by predominantly Negro laborers and farmers, respectively.

VENEZUELA Venezuela's natural constituents are the unique Maracaibo Basin; an arm of the Andes that becomes lower and more fragmentary eastward; a large area of plains or Llanos forming part of the basin of the Orinoco River; and an equally large area of Guiana Highlands. Each has its distinctive economic place in the whole that is Venezuela.

The central Andes have always shown the principal clustering of population. Here commercial agriculture using Negro slaves gained an early start. Crops have run a range from sugar cane, through cacao, tobacco, and coffee, to cotton. The better valley or basin lands are divided into large holdings growing commercial crops or fattening range cattle. Poorer lands with their patchwork pattern of small fields cannot produce subsistence crops sufficient to feed the country, so that food-stuffs must be imported. In this area is not only the densest population and largest city, Caracas (0.695), but also the major evidences of modernization, in the form of railroads, highways, modern buildings, cotton textile factories, breweries, and other signs of industrialization.

The Llanos are a great savanna plain reaching from the Andes to the forested delta of the Orinoco. European cattle were introduced into the Llanos before the middle of the sixteenth century; cattle production has been the dominant use of the area since that time. Natural endowment seems only marginally favorable for range grazing at present, but historical data indicate that man is responsible for a steady deterioration of conditions. To him, for example, is attributed the great extent of seasonal flooding, a major disadvantage to grazing. The Llanos are scantily populated, so that little advantage is taken of the navigability of the lower thousand miles of the Orinoco. *Ciudad Bolívar*, the area's principal city, is a port on the Orinoco and is connected with Caracas by a dry-season highway. A probable extension of petroleum production to the interior Llanos will certainly effect a transformation of the area.

The Guiana Highlands section is the most

sparsely populated and least-known part of Venezuela. Gold has been produced in quantity for a long time from only limited areas. There are undeveloped great resources in diamonds and both precious and base metals. Furthermore, the Highlands offer opportunities for agriculture and grazing under climatic conditions favorable to Europeans.

The Maracaibo Basin has what is described by some as the hottest and generally most-disagreeable climate to be found in all Latin America. It attracted little early settlement and was of minor national importance until the discovery of petroleum some quarter of a century ago transformed the Basin and the whole country. Sleepy, dirty *Maracaibo* grew to a modern city of about 233,000. Although petroleum is produced in eastern Venezuela, the major part continues to come from Maracaibo.

The dominance of Venezuela's economy by petroleum has been a mixed blessing to the country. Agricultural production has declined to the point



Indian carriers, Andes (U. S. D. A. photograph)

where vegetable foods and meats must be imported, at prices hardly within reach of the laborer. Peasants flock to oil fields and cities. European immigrants remain in the cities to dispossess Venezuelans of their jobs. The latter show little inclination to return to agricultural labor.

ECUADOR The third country, Ecuador, is naturally and culturally part of two different worlds, the Highlands and the Coast.

The Highland basins and valley are surmounted by a clustering of volcanic peaks unparalleled elsewhere even in the Andes. Within the basins and valleys dwells a dense population of agricultural Indians. In part they are workers on large estates and cattle ranches; even more they are communal subsistence farmers who produce some cattle for sale.

Quito (0.215), the capital and leading Ecuadorian city, lies in one of the mountain basins, connected by rail with Guayaquil on the coast. Although Quito is a political, rather than a commer-

cial or industrial city, it is still strangely out of place in its economic surroundings of subsistence Indian farmers.

The Coast is tropical in temperature, and ranges from rain forest at the north to steppe on the south. It contains most of the Negro, Caucasian, and mixed racial elements of Ecuador's population. It also has the major commercial center of the country in the port city of *Guayaquil* (0.221). In the coastal section originate most of the products and commodities making up the nation's exports: cacao, coffee, and fattened cattle, all from large estates; tagua nuts for imitation ivory, balsa wood, petroleum, gold, and *Jipijapa*, better known as "panama," hats.

The contrast between subsistence-farming Indian and commercially minded European or mestizo is not peculiar to Ecuador. With interruptions, it follows the highlands from Mexico to Peru and Bolivia.

57: Central and Southern South America

CENTRAL SOUTH AMERICA

Included in Central South America are Peru, 532,000 square miles, and Bolivia, 538,000 square miles. Together their area is about a third that of the United States. Peru's 8.558 million inhabitants added to Bolivia's 3 million give a total of under 12 million, of whom more than half are pure Indian and another third mestizo. The remainder is largely European, with a small percentage of Negroes and Orientals in Peru.

Peru and Bolivia have a long history of association. Pre-Inca cultures centered around Lake Titicaca, a body of water common to both countries. Bolivia was part of the Inca empire. As Alto Peru, Bolivia was included in the Spanish viceroyalty of Peru, until its transfer to the viceroyalty of Buenos Aires in 1776. The mountain boundary between the two countries cuts across major topographic features and through a dense and homogeneous Indian population, so that an old major nucleus is politically divided. The modern occupation pattern in Andean Peru is like that in highland Bolivia.

The mountains, then, are the common ground of the two nations. In broad plan the Andean structure of Peru is similar to that of Bolivia; they differ in detail. In Peru two mountain ranges striking parallel to the outline of the continent bound a broad, high plateau. Along the length of the plateau is a series of basins. Since the range nearest the coast is the water divide, streams tributary to the Amazon have incised the plateau with valleys that become increasingly steep sided and deeply cut until finally they are rugged canyons discharging into the Amazon lowland. The country is very high. The mountains are a majestic array of 20,000-foot snow-capped peaks. Much of the plateau surface lies above 12,000 feet. Only in the stream valleys are moderate elevations encountered.

The plateau of highland Peru is continued in the Altiplano of Bolivia, a mountain-girt plain 500 miles long by 80 wide, having an average elevation of some 12,000 feet. The Altiplano too has its series of basins that drop below the general upland level. Again the water divide follows the

crest of the westernmost range, but only part of the drainage goes to the Amazon. A part flows into the Parana-Paraguay system, while a part is interior and never reaches the sea. Lake Titicaca discharges southward to Lake Poopo and a region of undrained salt marshes.

Highland Bolivia is the real Bolivia in that it contains three quarters of the population, even though three fifths of the nation's domain is part of the continental-interior lowland. Highland Peru is but one of the two culturally important parts into which that country is divided. However, the mountain sections of the two nations are sufficiently alike in their cultural development to be discussed together.

The basic element in the occupation pattern is subsistence agriculture practiced by the dominant Indian population. The holdings are communal; the individual plots are small; terracing and irrigation follow old practices; methods are primitive. Native crops dominate: maize up to prohibitive elevations; Irish potatoes and quinoa beyond. Native domesticated animals, the llama and alpaca, are grazed on high pastures. The llama is a beast of burden and a source of meat; the alpaca yields a fine wool. Native plants and animals are supplemented by species introduced from Europe. Wheat and barley are raised at high elevations and sheep are grazed on high pastures. Cattle are found at lower elevations and sugar cane is grown in the valleys.

Superimposed on the basic Indian agriculture is a highly restricted, unevenly distributed system of large estates. They are owned by Europeans or mestizos, worked by Indians, and are operated for profit. Cattle and sheep are grazed and sugar cane, coffee, wheat, and fruits are grown according to the dictates of elevation and market demand. Commercial agriculture is most successful in the vicinity of mining communities. To an extent limited by transportation facilities, there is a movement of highland products to the coast. But not one single agricultural commodity produced in the mountains ranks high in the list of exports for either country.

Mining supplies the real commercial interest in the highlands. The industry is not exactly new,

since the pre-Columbian Indians mined and smelted the ores of gold, silver, copper, and tin, and mixed the latter two to form bronze. However, the landscape effects of mining operations by large foreign concerns are hardly to be compared with the modest changes produced by the Indians. Cajamarca and Cerro de Pasco in Peru, and Oruro in Bolivia are the centers of many discordant elements. Not only are there the structures, machinery, and towns directly associated with mining, but also local commercial agriculture and modern communication with coastal ports.

Highland-produced minerals overshadow all other items in Bolivia's list of exports. The country supplies fifteen per cent of the world's tin, as well as antimony, tungsten, silver, lead and zinc, copper, and gold. In Peru the domination is not so marked. Still, minerals constitute 60 per cent of the nation's exports, and copper, vanadium, gold, and zinc from the highlands equal the value of petroleum produced on the coast.

There are many towns in the mountains. Those founded by the Spaniards follow a set form: a square or plaza about which are the church and government buildings. The streets are lined with adobe houses, the more pretentious with a patio, and, if two storied, supporting a high balcony. The plan of city and house is familiar in Spanish America, not only in towns but also in cities. In the highlands of Peru and Bolivia there are few cities. The largest is *La Paz* (301,000), *de facto* capital of Bolivia, lying in the Altiplano a few miles east of the south end of Lake Titicaca. *La Paz* is the commercial center of the country on the rail line leading to the Chilean port of Antofagasta. There is local manufacture of matches, shoes, beverages, tobacco products, leather goods, and woollen textiles.

East of the mountains lies the bulk of Bolivia, the *Yungas* (eastern slopes) and the *Llanos*, and a large part of Peru, the *Montaña* (escarpments) and the plains. These large eastern sections of the two countries include the abrupt eastern forested slopes of the Andes and the tropical plains of the interior lowlands. Not all this section is rain forest. Part is savanna, and to the south, in the Chaco, the climate is steppe.

Few commercially minded farmers have settled in the lowlands due to the enormous difficulties involved in getting products out and supplies in. Yet this area has been invaded by exploiters of wild rubber, coca, and cinchona trees, and is being successfully invaded again, this time for petroleum. Cattle grazing was introduced to the eastern lowlands in colonial times. Plantations and agricultural settlements have shown it possible to produce a variety of crops: sugar cane,

tobacco, sweet potatoes, cacao, vanilla, coffee, cotton, bananas, and cassava.

Poor, expensive transportation holds back the development of what is potentially a rich land. Only products of high value per unit weight can be brought to market and leave a profit. There is little choice of routes to and from the vast area. One is by water along the Amazon. Another must pass over the double barrier of the Andes. A third leads south into Argentina. *Iquitos* was founded by Peruvians in 1863 as a "seaport" 2,600 miles above the mouth of the Amazon, but *Iquitos* is isolated in other directions. Peru completed its first trans-Andean highway in 1943, and Bolivia now has a road from the highlands to a port on a navigable Amazon tributary. The interest of foreign capital in petroleum may well do more to open the way into the lowlands than has been accomplished in the previous 400 years, particularly since an exceedingly promising oil field has been discovered in eastern Peru.

Bolivia has no counterpart of Peru's coastal section. Coastal Peru is the modern Peru of Europeans and mixed-bloods. It has the largest cities, produces the major commercial crops, and contains the country's industry, aside from that connected with highland mining.

The pre-Columbian Indians did not entirely neglect the coast. Along it they built one of the two roads running northward to Ecuador, and they established agricultural oases where rivers emerge from the mountains. But to the Indians the high mountain basins were more attractive than the cool, desert coast, and in one of the former was the Inca capital, *Cuzco*. Pizarro altered the situation by making coastal *Lima* capital of the new empire. *Lima* became and remained the great center of the Spanish possessions in America. The development of the coast, however, was slow, and it was no steady progression along a single course.

The coast can be called a plain only by broad interpretation. True plain is restricted to the extreme northern section. Elsewhere the mountains come nearly to the water's edge, leaving only a narrow apron built into the sea by deposition from streams. The coast has a climate remarkably cool for its latitude and so dry as to qualify as desert.

The Spaniards took over some of the Indians' irrigated oases. They found that in places domestic animals could alternate between fog-belt browse on the coast and that on the mountainside. They learned that guano deposits make excellent fertilizer. But major interest was in mining, and agriculture was restricted to the production of subsistence crops.

Commercial agriculture did not get well under way until the latter decades of the nineteenth century. Prior to then there had been an unrestricted exploitation of guano deposits for export, and mining of nitrates, also for export. The former was finally regulated by government edict into a permanent if shifting industry, and the loss of a war with Chile cost Peru its area of nitrate deposits.

Sugar cane was the first commercial crop grown extensively. Its success led to the introduction of others, notably cotton. Now cotton heads the list of agricultural exports. Maize remains a food staple, and rice is produced largely for the same purpose. The expansion of agricultural oases on the coast has reached the point of complete utilization of the readily available water.

The coast has produced petroleum since 1880. The fields are restricted to the section bordering Ecuador. Petroleum now constitutes half the total of mineral exports, and seems destined to increase relatively and absolutely. Petroleum has introduced its own peculiar modifications of the landscape in the form of oil fields, refineries, and industrial settlements.

The major city of Peru is *Lima*, 1 million, which is served by the port of *Callao*. Like the majority of Pacific ports of central and northern South America, Callao is little better than an open roadstead, improved somewhat by the building of a long breakwater. From Lima there is a railroad to the mining center of Cerro de Pasco in the mountains, and there are short railroads and roads along the coast. Lima is a mixture of the old, as typified by the venerable San Marcos University, and modern changes accompanying industrialization. In or near the capital city are manufactured sugar, cotton textiles, shoes, chocolate, and wheat flour.

Near the southern end of coastal Peru is *Arequipa* (0.120), the second city of the nation, and decidedly delightful as to both location and climate. From Arequipa a railroad climbs the Andes to Lake Titicaca and Cuzco. From the highlands come wool, hides, and other articles for export.

SOUTHERN SOUTH AMERICA

Included in this region are Argentina, 1,085,000 square miles; Chile, 297,000; Paraguay, 175,000; and Uruguay, 72,000. The total for the four countries is over 1,600,000 square miles, or nearly a quarter of all South America. The regional population of 27 millions, also about one-fourth the continental total, is divided among the four coun-

tries with Argentina having 17.6 millions; Chile, 5.9; Uruguay, 2.353; and Paraguay, 1.425.

Regional unity, both natural and cultural, is limited. However, included is most of South America's area of temperate climates. Within the region is the continent's one major expanse of highly productive plains. Racially the region is overwhelmingly European in stock. Pure-blood Indians constitute no important social or economic bloc. Negroes are few. A large and recent influx of European immigrants has transformed part of the region into something unique in Latin America.

There are major exceptions to these generalizations. For example, Paraguay is largely Indian, or better, mestizo. Guarani remains the common speech of the countryside. Climatically Paraguay lies on the line separating savanna from subtropical. But Paraguay and its capital, Asuncion, are inseparable historically from the countries to the south. Paraguay, like Uruguay, might well be a province of Argentina, were it not for the rivalry between Spain and Portugal that is perpetuated by Argentina and Brazil. Chile is rather remote in historical respects, just as it is isolated by the Andean barrier. The founding and growth of Chilean settlements have little in common with those of the countries lying east of the mountains. And Chile is more mestizo and less European than Argentina.

There is striking natural parallelism between Chile and the Pacific Mountain region of North America. Chile's domain is a strip some 2,600 miles long by 40 to 250 wide. The eastern or inland boundary is the water divide of the Andes. Between the Andes and the much-lower coast ranges is an irregular depression, the interior valley.

From the Peruvian boundary southward to 30° S., valley and mountains have one of the world's driest climates. The surface is barren and oases few. The section is, however, Chile's major source of mineral wealth. From 30° S. to about 36° the climate is of the desirable Mediterranean type encountered in California. Part of the interior depression is the Vale of Chile, the nuclear area of the nation. South of 36° the forest is heavier and rainfall more abundant. Finally, at about 42° S. the central valley is lost in a maze of islands and arms of the sea. The irregular glaciated coast provides innumerable harbors, in contrast to the unbroken northern coast. Rainfall reaches the maximum for extratropical regions and the forest is forbidding in its density.

The plains and basins bordering the eastern slope of the Andes in Argentina are subject to greater seasonal range of temperatures than is experienced on the Pacific coast. They are well

watered only where perennial streams emerge from the mountains. The plains continue eastward to the sea and they extend from the Bolivian boundary south to the Rio Negro, where they meet the barren, bleak Patagonian plateau. The interior plains and Patagonia are climatically desert, flanked by steppe. To the northeast the plains become humid grassland, with seasonally well-distributed precipitation of some thirty-five inches. Largely on a locational basis the plains are divided into three sections: the Gran Chaco, north of the Rio Salado del Norte; Mesopotamia, between the Parana and the Uruguay rivers; and the Pampa, which includes the remainder. To these divisions of the plain should be added the Andean border and Patagonia, to complete Argentina's natural regions.

Southern Uruguay is a continuation of the grassy Pampa. To the north the surface is rougher, reflecting an extension of the uplands of southern Brazil. However, in no place does the elevation exceed 2,000 feet. The climate maintains a temperate, sea-conditioned range, subject to occasional invasions of cold southern air from the Antarctic air-mass.

A margin of the Brazilian plateau dominates the portion of Paraguay lying between the Paraguay and Parana rivers. The plateau breaks off abruptly on the west, reaching the Paraguay at only a few points. At the confluence of the two rivers the plateau gives way to low marsh and swamp. West of the Paraguay is the nation's recently acknowledged section of the Chaco, newly important because of petroleum developments. Paraguay's climate borders on tropical. It is still subject to comparatively wide alterations of temperature and its 60-inch rainfall is well distributed through the year.

CHILE The Inca empire managed to extend its influence southward to middle Chile. South of there the combination of undesirable country and fierce Araucanian Indians halted conquest. Despite unconquerable Indians and absence of gold, Spaniards came early to middle Chile, founding Santiago in 1541 and Valparaiso, the port, two years later. The best lands of the central valley were divided into large estates, soon owned by the mestizo offspring of mixed marriages, and worked by mestizos and Indians. Grazing was areally most extensive, but there was irrigation agriculture growing both American and European crops.

There was little immigration to the isolated Chilean settlements, so that as late as 1700 the population numbered only some 100,000. Settlement was almost entirely restricted to the valleys of middle Chile. There feudal estates fostered a

wide disparity between the wealthy few and the impoverished mass of peon laborers, despite the fact that racial differences between the classes became constantly less as the mestizo element became more and more dominant. Food crops were so secondary to grazing that they provided insufficient sustenance for the population. There was a steady migration of peasants across the Andes to Argentina.

There was little broadening of the economic base until the nineteenth century, when several unforeseen developments changed the picture. First came a group of German settlers about the middle of the century. Even though the Araucanians resisted final defeat until 1882, the Germans began clearing the forests lying between the Vale of Chile and the beginning of the florded coast. The Germans were excellent pioneers, as they have been elsewhere in Latin America. Furthermore, they set the example for others, including landless Chilean peasants. They introduced crafts such as iron and wood working, and the making of shoes. The settlement pattern differed from that in the Vale; the farms were relatively small and they were worked by their owners.

The second series of developments came with minerals, and it involved the sparsely settled desert section of northern Chile. Around the middle of the nineteenth century important finds of silver and copper were made. Copper has been the basis of a permanent industry; production during periods of great world demand gives Chile a leading position as an exporter of that metal. The market for nitrates caused a booming production by 1860. Requirements of nitrate as a fertilizer and its by-product, iodine, remained fairly constant; wars increased its use for explosives. Fixation of nitrogen from the air, perfected about 1920, has seriously curtailed the use of natural nitrates. In 1910 Chile produced 60 per cent of the world consumption; in 1926 only 25 per cent. Iron ore occurs in an excellent deposit in the southern part of the desert. For a number of years the entire output has been shipped to the United States. Abundant coal of poor quality is found in coastal middle Chile. Here it has been mined for over a hundred years for local consumption. Mining has broadened the national economic base, but its unpredictable fluctuations have not contributed to economic stability.

Present-day Chile is an assemblage of diverse lands and developments. In the desert north is concentrated the unreliable activity of mining. The old system of grazing and irrigation agriculture on large estates centers about the Vale of

Chile. Here the production of food crops is still low, and there has been only moderate emphasis on those products for which the Mediterranean climate is especially adapted: deciduous and citrus fruits, vegetables, and grapes and wine. Markets for specialty products are distant and limited.

In this old nuclear area of middle Chile are the largest cities and most evidence of modern industrialization. *Santiago* (0.952) and *Valparaiso* (0.210) are the major centers employing the 116,000 Chileans engaged in the manufacture of wine, beer, wheat flour, furniture, sugar, leather, shoes, and woolen textiles. Hydroelectricity provides the power; former peasants the labor. Markets are still largely local.

The area of newer settlement to the south shares in urbanization and industrialization. Its two major cities, *Concepcion* (0.090) and *Valdivia* (0.040), rank third and fourth in the nation. From the surrounding rural countryside come beef cattle, dairy products, wheat, Irish potatoes, and apples, all indicative of the cool, moist climate.

Further south is the sparsely inhabited fiord coast. Here is abundant excellent timber, although Chile is an importer of lumber. The fisheries are potentially productive; during World War II canned fish from the area reached the export market.

Near the end of the continent the coolness of summer curbs forest growth and brings on open grasslands. On the Strait of Magellan is the city of *Punta Arenas* (Magallanes) (0.028) whose economic justification has long been the grazing of millions of sheep. The recent discovery of petroleum in Chilean Tierra del Fuego has initiated a rush of adventurers and settlers to this farthest-south section of Latin America, and alterations of the cultural scene are coming rapidly.

ARGENTINA The plains of southern South America played a very minor part in the Spanish colonial structure, since they lacked both minerals and dense populations of tractable Indians. The flat, open country was a vast monotonous stretch that had to be crossed to reach Peru from the Atlantic.

The Plata estuary seemed a likely starting point for an overland route to Lima. A base was established at a good landing place, the site of Buenos Aires, in 1535. The base was abandoned within the year and the settlers moved up the Parana and Paraguay to the mouth of the Pilcomayo. There they found high ground and a fairly dense population of agricultural Guaraní Indians. At this

point Asuncion was founded, the first permanent settlement in the region.

Now the founding of settlements came from the north and not from the sea. The earliest were located at oasis sites along the western border of the plains. Of these, Santiago del Estero in 1553 and Tucuman in 1564 were established from Bolivia; and Cordoba from Asuncion in 1573. Also in 1573 and from Asuncion, Santa Fe was founded on the Parana. Finally, Buenos Aires was permanently established in 1581 from Paraguay. The route to Peru was adjusted to pass through the Cordoba and Tucuman oases.

Cattle, horses, sheep, and goats were introduced by the first Europeans to reach the plains. Numbers of them escaped and survived to multiply amazingly in a highly favorable environment. The plains Indians were transformed into well-fed, fierce horsemen. The *gaucho* was born out of the vigorous life involved in pursuing wild cattle. And the plains gained a function in colonial economy: to supply Peru with mules, fodder, and cattle.

The Buenos Aires settlement languished under a system which demanded that all imports into the plains come via the long Panama-Peru route. Despite a considerable flouting of Spanish restrictions against imports directly by sea, Buenos Aires was a city of only some 20,000 in 1776, the year when the viceroyalty of Buenos Aires was created to include what are now Argentina, Uruguay, Paraguay, and Bolivia. The objectionable barriers to trade were removed and settlement encouraged. The change was made not entirely out of consideration for the colonists. The Portuguese were interested in the Plata area actively enough to establish Colonia across the estuary from Buenos Aires. The Spaniards countered by founding Montevideo in 1726, thus assuring the Spanish character of the *Banda Oriental* or eastern bank.

Buenos Aires responded to encouragement by doubling its population to 40,000 by 1800. The nuclear pattern for the whole great region was set; its centers were Buenos Aires, Montevideo, Asuncion, and the western oasis towns. For each population cluster there was a largely self-contained economy. On both sides of the Plata estuary it was large ranches with little production of vegetable foods. In the oases and around Asuncion there was a stronger agricultural tradition. In common there was little exterior trade and rural population densities were low.

Transforming changes were initiated about the middle of the nineteenth century. Their appearance was due to a combination of improved land and sea transportation, an apparently insatiable European urban market for food, and large-scale

immigration that included Italians, Germans, and British, as well as Spaniards. The effects of the changes were felt in many of the world's grasslands; in southern South America they centered in the Pampa.

Meat, hides, and wool were the obvious offerings of a pastoral economy to foreign markets. Shipment of live feeder stock gave way to chilling or freezing the carcasses of fattened animals. The care and fattening of improved breeds meant producing feed crops. This was done by immigrant peasants who did not share the native disdain of agriculture. Gradually agriculture found a place. It was discovered that the demand for wheat and maize was quite as great as for meat, hides, and wool. Even fruit, vegetables, and dairy products could be sold to city dwellers lacking the pastoral tradition. Trial and error dictated a division of Pampa lands into those suitable for crops and those suited to grazing.

The landscape resulting from less than a hundred years' intensified use of the Pampa shows little that is thought of as typically Spanish-American. Nor can it be matched in western Europe. It is, however, reminiscent of the agricultural interior of North America. There is the same intricate pattern of railroads; endless fields; farmsteads with a windbreak of trees; and grain eleva-

tors in shipping towns. The land is owned in large average units, but its cultivation is on a smaller scale. The population is clearly European, not mestizo, and while its density is low, the concentration into cities is surprisingly large.

The Pampa is the relatively small central core to which the remainder of Argentina is tributary. From Patagonia come sheep, wool, and petroleum; sugar from Tucuman; grapes and wine from Mendoza; *yerba mate* from Formosa on the Paraguayan border; and from the Chaco, cotton, all to and for the Pampa. In the Pampa are the bulk of the nation's people and all the great cities: *Buenos Aires* (2,983) and its suburb, *Avellaneda* (0.279), *Rosario* (0.468), *Cordoba* (0.370), and *Eva Peron* (*La Plata*, 0.207).

The figures for the major Pampa cities bring out the significant fact that nearly a third of the total Argentine population is crowded into four urban centers, and this in what is generally considered to be an agricultural country. City growth is common to industrial nations, but it occurs also in some agricultural countries prior to industrialization. Urbanization under the latter circumstances may be due in part to mechanization of agriculture, but there is also an important mat-



Large farmstead, Argentina (American Geographical Society)

ter of the real or fancied advantages of city life.

The basis of Argentine urbanization is attested by the half of the gainfully employed who are engaged in industrial pursuits. The figure is somewhat deceptive in that a considerable percentage processes the yield of farm and ranch for export. Industry is predominantly of a light nature: food-stuffs, textiles, shoes, beverages, glass, and furniture. Wars have cut off manufactured articles formerly received in exchange for raw materials; protective tariffs nurture new industries.

For heavy industries Argentina lacks natural advantages. There is a shortage of metallic ores; coal is imported; waterpower is too remote to be available; petroleum, however promising its future, is presently inadequate to power industrial expansion. However, heavy industry can be established and maintained as a matter of national policy. There are indications that this is happening in Argentina now.

URUGUAY While Uruguay does not entirely parallel the Pampa in natural endowment, its history of utilization is something of a delayed repetition of the sequence in the Pampa.

The pastoral tradition is old and firmly fixed in Uruguay. The grazing of cattle and sheep was introduced from Argentina. The industry spread until it effectively occupied the entire national domain, gave Uruguay the highest population density among South American countries, and established a racial stock that is nearly pure European.

Agriculture was so neglected that as late as 1888 Uruguay was an importer of wheat. A late European immigration introduced agriculture along the coast, to which it remains largely confined. Now the country produces a slight surplus of grains and fruits.

Uruguay too has its great dominating city in *Montevideo* (0.800). Primarily a commercial center, there is processing of animal derivatives for export and some manufacture of textiles. Great industrial expansion seems unlikely in a country so little endowed with mineral resources, and having Latin America's most advanced social legislation.

PARAGUAY If Uruguay is an extension of the Argentine Pampa, Paraguay is an outlying, backward province. There are other differences: the Paraguayan people are overwhelmingly mestizo, with strong emphasis on the Indian component; and there is an old tradition of agriculture.

From the standpoint of arable land, climate, and vegetation resources, the country is richly

endowed. It is handicapped by remoteness and it is denied the possible advantages of affiliation with a larger nation by rivalry between Argentina and Brazil. Poverty, disease, and ignorance among the masses of its population match conditions encountered anywhere else in Latin America.

A fraction of the country's total area produces an astonishing variety of food and commercial crops on large estates worked by landless peasants. Slow and expensive transportation to the sea restricts exports to goods that stand shipping and have high value per unit weight, such as cotton, quebracho extract for tanning, dried beef and beef extract, mate, tobacco, and orange-leaf extract for perfumes.

There is a single population nucleus centered on the old city of *Auruncian* (0.206). The eastern part of the country is inhabited by a few bands of Indians.

The exploitation of the petroleum resources of the Paraguayan Chaco could transform the country's economy. But it could do so without materially altering the lot of the average Paraguayan citizen.

BRAZIL

Brazil, with its 3.29 million square miles and 53 million inhabitants, is the giant country of Latin America. It occupies approximately half of South America and contains about half its population. Of all the world's nations, Brazil is exceeded in size by only three, Russia, China, and Canada. Its maximum north-south and east-west dimensions are each nearly 2,700 miles.

Brazil shares a common boundary with every other South American country except Ecuador and Chile; within is all the cultural diversity suggested by such widespread contacts. There are a large Negro element, and Indians living in a primitive state. Tropical, subtropical, and temperate crops are produced. There are both large estates worked by landless laborers and small farms worked by their owners; an old pastoral tradition; and great cities and expanding industries. On the other hand, Brazil has qualities distinctly its own, as, for example, a common tongue that is Portuguese rather than Spanish.

Brazil is a land of magnificent natural resources. It has been stated repeatedly that Brazil stands first among the nations of the world with respect to proportion of total area qualified for productive use; the figure has been placed as high as 80 to 90 per cent. This means largely that Brazil is well watered; has a minimum of precipitous and barren mountain lands; and lacks prohibitively cold climates. Soils, minerals, and forests

are to be found that are of the first order of excellence.

It is obvious that 51 million people cannot truly occupy a land the size of Brazil. Of the three major natural divisions: Brazilian Highlands; Plains; and Guiana Highlands, the first is in effect the true Brazil of the past and present. It contains the great bulk of the population, and has been and is the area of major utilization and production.

The Brazilian Highlands occupy about half the total area of the nation. They may be described as a plateau of irregular surface ranging in elevation between 1,000 and 3,000 feet. A number of low ranges rise above the general plateau level. From the sea or from the narrow plain which occupies sections of the coast, the abrupt eastern face of the plateau appears to be a true mountain range and is generally so called. Latitudinal extent and variation in exposure and elevation are responsible for a wide difference of climatic and vegetational conditions within the Highlands area. The northern coast is tropical rain forest; the northern interior is savanna; while the southernmost projection of the plateau is temperate forest land.

An earlier chapter describes the development of one Brazilian culture hearth on the northern Highlands coast. There early in the sixteenth century was established a commercial plantation system involving Negro slavery that was to spread northward with the expansion of sugar production.

Nothing was said regarding the fate of the settlement far to the south in São Paulo. Here the course of development was along quite different lines. Lacking means and experience, there were no system of commercial plantations and no Negro slaves. The *Paulistas* were small farmers and herdsmen who roamed the interior looking for minerals and Indians to enslave. Parties of wanderers often took their families with them and were gone for years. There was sufficient miscegenation to form a mixture of Europeans and Indians termed *mameluco* in Portuguese. Out of this new racial group emerged the Brazilian equivalent of the Argentine gaucho, a hardy, admirable herdsman who pioneered the new land and continues to populate sparsely the whole of the remoter interior of the plateau.

The search of the *Paulistas* for minerals was rewarded by a major discovery of gold in 1693, and diamonds a few years later. The center of activity was in what is now the state of Minas Geraes. To this region of bonanza richness came not only *Paulistas* but also Brazilians from the sugar area and the hopeful from many parts of the continent and the world.

The end of the eighteenth century concluded the great period of the mining boom. There were abandonment of mines and loss of population. But the era left in its wake a settled Minas Geraes and a Rio de Janeiro that had emerged as the most important of the many excellent Brazilian ports. The decline of mining in Minas Geraes sent many of the *Paulistas* home a little better off financially than they had been. A mixed grazing-farming on large estates was not highly remunerative. However, in the offing was a new development, the production of coffee.

The nineteenth century found Europe a highly receptive market for coffee. Coffee planting in Brazil did not start in São Paulo, but there it found favorable natural conditions and a willing populace. The plantations of São Paulo captured the world leadership in coffee production, a position not yet relinquished despite a new and growing rivalry with cotton for crop acreage. A large immigration of both Brazilians and Europeans was attracted by the agricultural prosperity. São Paulo became the most modernized section of Brazil, and its chief city, São Paulo, gained to a position second only to Rio de Janeiro.

The system of plantation-coffee agriculture has expanded slightly into the temperate forest lands of extreme southern Brazil. Beyond lies a sparsely settled zone, and still beyond there appears a pattern of occupancy quite different from anything else in the nation.

Through the early part of the nineteenth century the extreme south was lightly occupied by Indians and by herdsmen who stuck to the grassy lands of the western portion of the region. Fear of aggression from the neighboring Spanish countries led to the planting of a colony of Germans about 1825. Though later reinforced by Italian and Slavic immigrants, the Germans remain the dominant element in a rapidly growing population.

Particularly in the state of Rio Grande do Sul, the European character of the settlements is distinct. German-dominated areas are distinguished by Old World architecture, crops of rye and maize, and the production of hogs. Italian settlements are marked by vineyards. Everywhere the holdings are of modest size and are worked by the owners. To serve the area is Brazil's fifth largest city, Porto Alegre.

Outside the Brazilian Highlands lies about half the area of the entire nation. Most of this remaining half is within the drainage basin of the Amazon. In all this enormous region live only some 4 million people. These few are highly clus-

tered, leaving vast forested stretches virtually uninhabited. Settlement in the true sense of sedentary agriculture has not reached the Amazon basin. Its economic history is almost entirely one of gathering the wild products of an uncultivated forest country: Brazil nuts, timber, rubber, resins, orchids, fish, and even Indian slaves. As with mining, increased demand or new discovery brings population; exhaustion of the product or loss of market results in abandonment.

From 1850 to World War I, demand for rubber brought a spectacular boom to the Amazon. River ports such as Manaus, Santarém, and Belém grew enormously and even took on airs of urban sophistication. The bubble of prosperity was burst by the competition of Malaysian plantations and the destruction of the most-available rubber trees. The forest reclaimed hopeful townsite clearings.

During the last decades North American interests have attempted plantation cultivation of rubber trees in the Amazon basin. They have now relinquished their large holdings, giving as the reason their inability to control destructive plant diseases. Incidentally, the medical staff proved that a section of tropical rain forest in Amazonia could be made the healthiest spot in Brazil.

Belém, Brazil's sixth city, is the one large urban center of the Amazon region, and its position is highly marginal, as indicated by a location near the mouth of the river.

Present-day Brazil adheres to the course outline here sketched. The diverse landscapes of human occupancy that compose Brazil's cultural history are still defined: tropical plantations on the north coast of the Highlands; coffee and cotton estates in São Paulo; the European-type farmsteads of the southern states; extensive grazing on the Highlands frontier; and gathering in the Amazonian forest. Mining, which has contributed more wealth than everything else combined, continues to yield gold and diamonds. It is in a new era of activity with exports of manganese; an intensified exploitation of iron and coal deposits; and the discovery of petroleum in 1940.

Two related aspects of recent developments, urbanization and industrialization, are an extension but hardly a part of the old outline. They serve to accentuate the contrasts in a land that has both stone-age Indians and the utmost refinements of urban civilization.

Brazil's six largest cities: *Rio de Janeiro* (2.419), *São Paulo* (2.219), *Recife* (0.534), *Bahia* (0.424), *Porto Alegre* (0.401), and *Belém* (0.225) contain more than a tenth of the inhabitants of a

nation whose average density is about thirteen per square mile. Obviously urbanization is not the product of overpopulated rural sections. The extent of industrialization does much to explain it.

Industrial production is now two-and-one-half times the combined output of agriculture and grazing. Manufactured products constitute nearly a fifth of the total exports. So far industry is concerned primarily with textiles, shoes, hats, clothing, foodstuffs, tobacco, paper, furniture, matches, cement, and the like. There is a marked departure from light industry in new blast furnaces to utilize the superb iron ores of Minas Geraes and processed coal from the far south. Tremendous waterpower resources make up in part for the deficiency in coal.

THE GUIANAS

Adjoining Brazil on the north are three remnants of European empire in America: British Guiana (83,000 square miles and 408,000 inhabitants); Dutch Guiana or Surinam (55,000; 210,000); and French Guiana and Inini (65,000; 29,000). The effective territory of each of the Guianas is a strip of tropical coast plain. Back of the plain rises the steep escarpment of the Guiana Highlands, over which the numerous rivers plunge in rapids and waterfalls.

Plantations are worked by Negroes, who constitute the major racial group in the Guianas. In addition to tropical crops, exports include timber, other forest products, and minerals. Particularly important is the mining of bauxite in British and Dutch Guiana, major world sources of this ore of aluminum.

In French Guiana was the notorious Devil's Island penal colony. Of greater cultural interest are the Bush Negroes or *Djuka* living principally in Dutch Guiana. The *Djuka* are the descendants of escaped slaves who in the forests of Guiana recreated with but slight modifications a way of life that is West African.

The Guianas confirm the opinion gained in British Honduras and other foreign possessions that in no case have European powers developed in tropical America a plan of utilization that is successful alike for capitalist, laborer, and the land itself.

CONCLUSION

Latin America is "Latin" only in a limited sense. Racially much of the Cordilleran population is pure Indian, not European. The Caribbean borders, the West Indies, and the Atlantic coast of northern South America are overwhelmingly Negroid.

So few people living in isolated groups over so great an area leave room for a diversity of cultural landscapes: the highland Indians of Guatemala and the lowland tribes of Brazil; African Haiti and the Djuka of Surinam; Spanish-colonial haciendas of Mexico and the herdsmen of interior Brazil; miners and forest gatherers; the Vale of Chile and the Argentine Pampa; and

finally, modern cities and growing industrialization. But, whatever the diversity and whatever the name, here is a unique combination of man's impressions on the land. Together they entitle Latin America to classification as a realm in the American division of the New World.

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TRANSITIONAL TERRITORY
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MAJOR AREAS AFFECTED BY
THE NEW WORLD REVOLUTION